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The Clearing House for Information.

Some telephone men have said that the business breeds ignorance and selfishness. It has been asserted by men in the field that while it is not absolutely impossible to get a man to prepare a paper for a convention, it is like pulling teeth to draw out a few pointers on his methods of handling some detail of his business.

TELEPHONY, because it is a practical journal, is interested in all the problems which arise in telephone practice, and from time to time has occasion to collect information about them. Its experience has usually been quite the reverse of that mentioned by some of its pessimistic friends in the operating companies. It feels that any lack of willingness to give up information may come from a half-defined fear for one of two outcomes. First, modesty may lead a man to think his ideas are no better than those of his neighbor; or, second, that, if they are better, he will be called on to give information to so many people that his time will not suffice for this "good will" work.

As a matter of fact, a great many persons in the first class are the very people who can give the most helpful pointers. Even if their general methods are not novel, they can usually give special reasons, and experiences which have confirmed them in their adherence to a practice, so that their discussion may have at least an affirmative value.

The objections of the man who fears that he will be called upon to duplicate work repeatedly, for the benefit of but a few persons, are wholly valid. This condition at once suggests the desirability of a recognized medium for the exchange of ideas, so that a man can put his inquiry before many people at once, and that those who answer may, in answering him, respond to all inquiries which would otherwise gradually filter in from individuals.

A friend to whom we have roughly outlined our belief on this question appropriately replies:

"The case is this—I may be worrying myself blue in the face over some particularly exasperating problem of the telephone business, with which I have had no previous experience, and may be, figuratively speaking, 'up a tree.' The chances are a hundred to one that some other telephone man, somewhere else, has worried over and solved that identical problem. Now, if I could get his ideas about the matter, I would not only have the benefit of his experience in the same, but would save myself quite a lot of work and

worry, and could, by taking his idea as it stands, or improving upon it or adapting it to my own conditions, have the matter straightened out in a very short time."

Someone will say that this is all right for the man who has not ability enough to work out his own problems. Such a view is both narrow, and incorrect. There are a few "sponges" in the telephone business, as in all others. But, just look about you, and you will find that the men who are most eager to get the benefit of your experience are the very ones who have the most valuable information to give in exchange.

In casting about for a medium of exchange, it will not take an operating man long to reach the conclusion that the columns of TELEPHONY furnish the only practical outlet. Its size and weekly publication admirably fit it for such a purpose, no less than its policy of meeting the needs of its readers as it finds them.

The interest in our department "Letters on Practical Subjects" leads us to believe that our readers wish this work extended. Accordingly, we are arranging this week to start a new section, "Questions for the Field." Any telephone man who has a problem requiring the experience of a number of others is invited to send it in for publication in this department. We hope every operating man will get to work to make this a success by sending in his troublesome problems—and giving his experience in response to the requests of others. We leave this department in your hands —will you make it a success, for the good of the business in which you are engaged?

A Substantial Project for Rate Regulation.

The state of Massachusetts has taken action looking toward the regulation of telephone rates which promises to stand as an example of the only method of attacking this problem which can adequately prove whether the principle of regulation by state authority is feasible or impractical. In many respects the present situation in Massachusetts is less complicated than in the western states, the comparative absence of competition making the adoption of regulative measures at the same time more essential, and less beset by difficulties than would be the case anywhere west of the Hudson River. On the other hand, the operations of the New England Telephone & Telegraph Company, which, with the consent and co-operation of its officers, has been under investigation, embrace a wide field. Nearly all the practical problems of the large metropolitan district, the busy single exchange of an important isolated or suburban city, villages of all sizes, long and short haul toll business, and rural line development are presented in rather startling magnitude.

At a time when a series of complaints, and protests from organized subscribers in the Metropolitan district of Boston made the situation acute, the Massachusetts Highway Commission determined upon a thorough investigation of the telephone company's rates and service. The relation between the conditions throughout the state and those in Boston, the capital of Massachusetts and main distributing center for New England, made it essential to give the investigations a state-wide scope. The firm of D. C. and Wm. B. Jackson was engaged to make a preliminary report, and in the spring of 1908, presented to the Massachusetts Highway Commission a plan for an inventory and appraisal of the company's entire property in Massachusetts, to be followed by a study of traffic. On recommendation of the Highway Commission the legislature appropriated $30,000 for the appraisal, the results of which are summarized in the report printed on other pages.

The actual work of collecting data for the inventory of the telephone plant was carried on by a special force of carefully chosen men under the direction of Dr. Hammond V. Hayes, formerly chief engineer of the American Telephone & Telegraph Company. About 220 men were employed on the inventory and appraisal, and the care with which the work was organized, by the co-operation of Dr. Hayes, the officials of the telephone company, and the firm of D. C. & Wm. B. Jackson, the experts representing the Highway Commission, resulted in its being prosecuted with speed and accuracy. All items inventoried were actually inspected by the men in the force under Dr. Hayes, and a complete check of all parts of the inventory, made independently by representatives of the Highway Commission's experts, was then resorted to. Every precaution was taken to eliminate error, although, fortunately, little was found in the original reports. A great quantity of valuable data bearing on costs, depreciation, etc., was collected, and independent experts were employed to check the appraisal, so that the final figures presented to the Highway Commission are reliable.

The magnitude of the work is partially indicated by the size of the inventory, containing, in 14 large volumes, lists of the items making up the entire plant, valued at $34,133,270, comprising the equipment for 247 central offices, with 2,367 operators' positions, 2,721 miles of underground ducts, and 452,660 miles of wire, with other parts in proportion.

By the thoroughness of the methods adopted, enforced under the supervision of competent experts who are wholly disinterested, the Highway Commission has provided itself with a most valuable groundwork for future action in advising rate modifications. The work, although costing a large amount of money, not only accomplished the purpose of the Highway Commission, but has furnished much valuable information to the telephone company, which has agreed to bear the expense. It is expected that the traffic studies will be carried out soon, with the object of placing in the hands of the commission information upon which it may base recommendations for rate modifications.

The state of Massachusetts is fortunate in having officials who realize the magnitude and complexity of the problems involved in telephone regulation, and is to be congratulated on having treated them in the spirit of thoroughness shown by the results already attained.

Insurance of Telephone Property.

Most Independent telephone companies have trouble with their insurance. Managers are of the opinion that they can get neither the kind they need, nor what they are entitled to have; and that they pay too much for the poor protection they get. Mr. Hoge's investigation is the first general step toward improvement.

An Experimental Alternator for High Frequency Ringing

By Frank F. Fowle

To signal a distant operator by throwing a drop connected to an uncomposited toll line, alternating current at a frequency of about 1,000 cycles per minute or 16.7 per second is usually employed. Over simplexed toll lines, used simultaneously for telephony and telegraphy, current of this character is operative, provided it comes from a source which is not grounded. On composited toll lines, however, it is not practicable to employ this current on account of interference with the telegraph relays. Impedance coils used in the composite apparatus do not offer sufficient effective resistance to alternating current of this low frequency to prevent it from passing through the telegraph relays, and causing them to "chatter" in such a way as to break up the telegraph signals. Accordingly some other means of signaling over composited toll lines is necessary.

Some years ago this was often accomplished by using one of the two composite telegraph circuits for transmitting signaling current, but this sacrifice brought the economy of the plan about on a level with that of the simplex, unless the line was duplexed. The latter arrangement will permit the use of three telegraph circuits over two metallic toll circuits, one composite circuit being reserved for the duplex signal circuit. This arrangement does not meet all conditions with a large degree of flexibility, and, moreover may require the use in some instances of telegraph repeaters, with the consequent expense of attendance and supervision.

The need for a better signaling system led to the development of apparatus to produce, and operate under a current of much higher frequency. Some of the early experiments were carried on with alternating current obtained from the secondary of a transformer having its primary connected in series with a battery and interrupter. The corresponding signal receiving device was a relay with normally closed local contact, adapted to alternately make and break contact rapidly when the relay was traversed by high frequency alternating current. The relay was constructed so as to be unresponsive to the relatively sluggish impulses of the telegraph current. The interrupters were connected to a battery of dry cells and the transformers used were so constructed that the available energy was limited to a very small amount, so that it was necessary, in a large toll office, to employ many such interrupters. As these interrupters were rather expensive to maintain, it is evident that a power generator suitable to replace them would be of considerable value. The writer was called upon to design such a generator, and a description of the design and test of the experimental alternator planned for the purposes described is here presented.

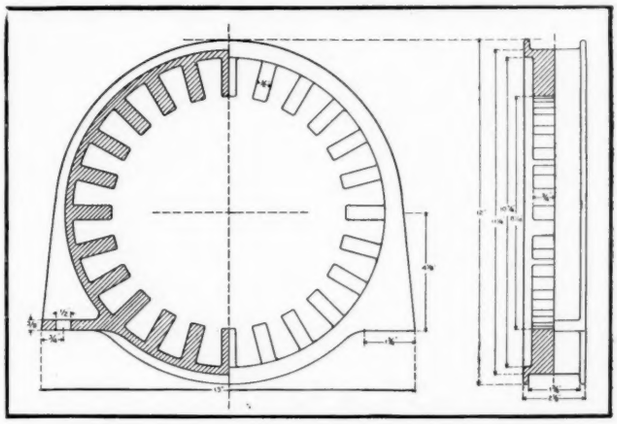


Fig. 1. Form and Dimensions of Field Ring.

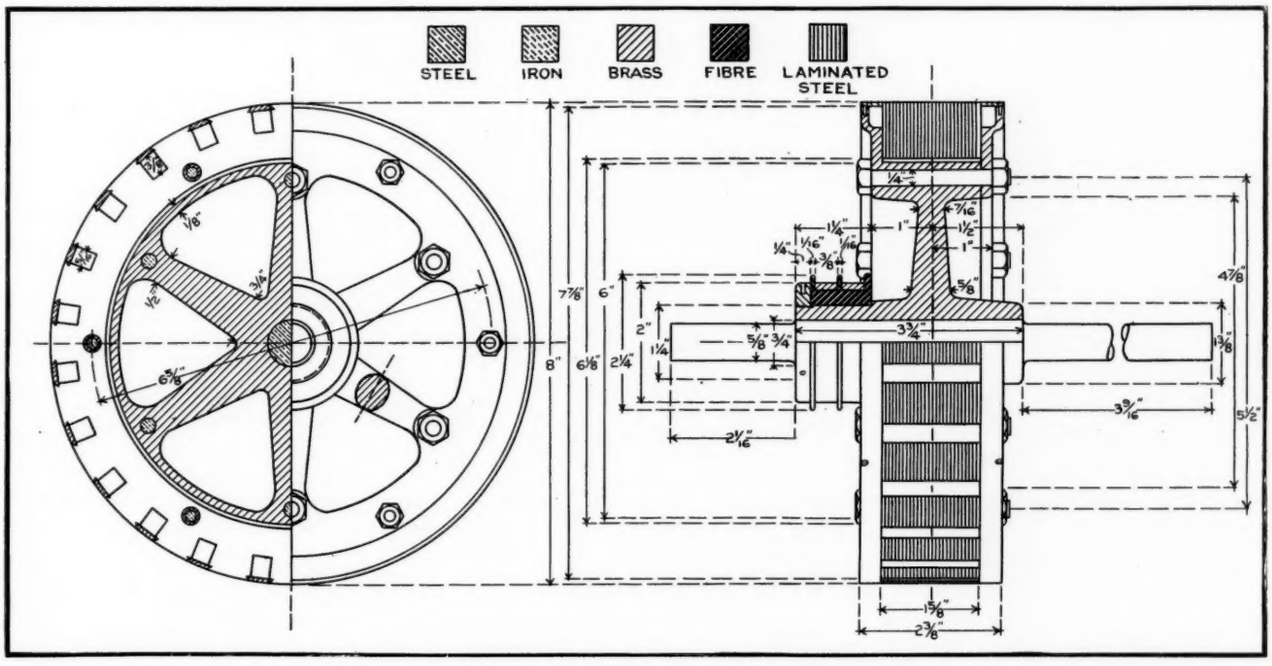


Fig. 2. Armatures, with Spider, Shaft and Collector Rings.

Neither the voltage nor the frequency of the current output from the interrupter transformers was definitely known,

but the frequency was believed to be in the vicinity of 300 cycles per second. Accordingly this value of frequency was selected as the rated generator frequency, a considerable margin of speed variation being provided for in the design. High frequency alternators of very small output were available for the work, if the experiments proved successful, but their output was considered too limited. A rated output of 100 volt-amperes, 4 amperes at 25 volts and 300 cycles, was chosen. A low density of magnetic flux at this output was also decided upon, in conjunction with a field winding of very moderate temperature rise when properly excited for the rated output, so as to provide a margin for permissible increase of field current and magnetic flux density at low speeds and frequencies. A speed of 1,500 revolutions per minute was fixed upon, in order to provide plenty of margin in peripheral armature speed to allow for approximately double the rated speed in revolutions.

The dimensions of the machine were necessarily somewhat larger than would be called for on a normal rating of 100 volt-amperes; in fact, an output of 375 volt amperes on non-inductive load was obtained under test, and this could have been increased at higher speeds. The rated speed and frequency necessitated a field frame having 24 poles. Inasmuch as the machine was experimental, a construction having one armature slot per pole was chosen, as being the simplest and cheapest. It was decided to connect all of the armature turns in series, and this fixed the requirement that each of the 24 coils must generate one twenty-fourth of the total voltage.

The speed being determined, the choice of the best combination of field flux and armature turns is largely a matter of assumption and trial. The voltage was calculated from the formula,

$$E = 4.44\, t\, \phi\, n\, 10^{-8}. \qquad (1)$$

Where t = total number of armature turns in series.

ϕ = total number of magnetic flux lines enclosed by each armature turn.

n = frequency in cycles per second.

Allowing for an armature drop of 5 volts at full load, the no-load voltage would be 30 volts. Assuming 10 turns per armature coil and substituting all the known or assumed quantities in formula (1) to find the flux ϕ, it was found that 9,500 flux lines per pole would be required.

There is always some leakage of flux lines from the field pole pieces, which does not enter the armature; therefore a leakage factor is commonly assumed, and in this instance it was assumed that the flux in the field cores must be 1.3 times the armature flux. The choice of a leakage factor is always accompanied by some uncertainty, and offers, perhaps, the principal opportunity for miscalculation. Leakage factors are determined from tests upon completed machines and vary considerably with the contour of the field frame. The necessary flux in each field core was, therefore, 12,350 lines. It was also assumed that only 80 per cent of the cross-sectional area of the armature was magnetic iron, to give due allowance for the loss in space caused by the laminations.

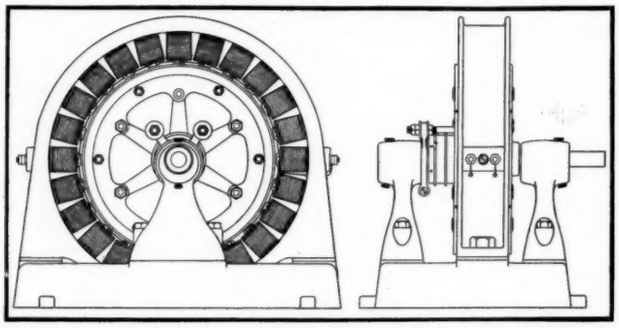


Fig. 4. Assembly of the High Frequency Signaling Current Generator.

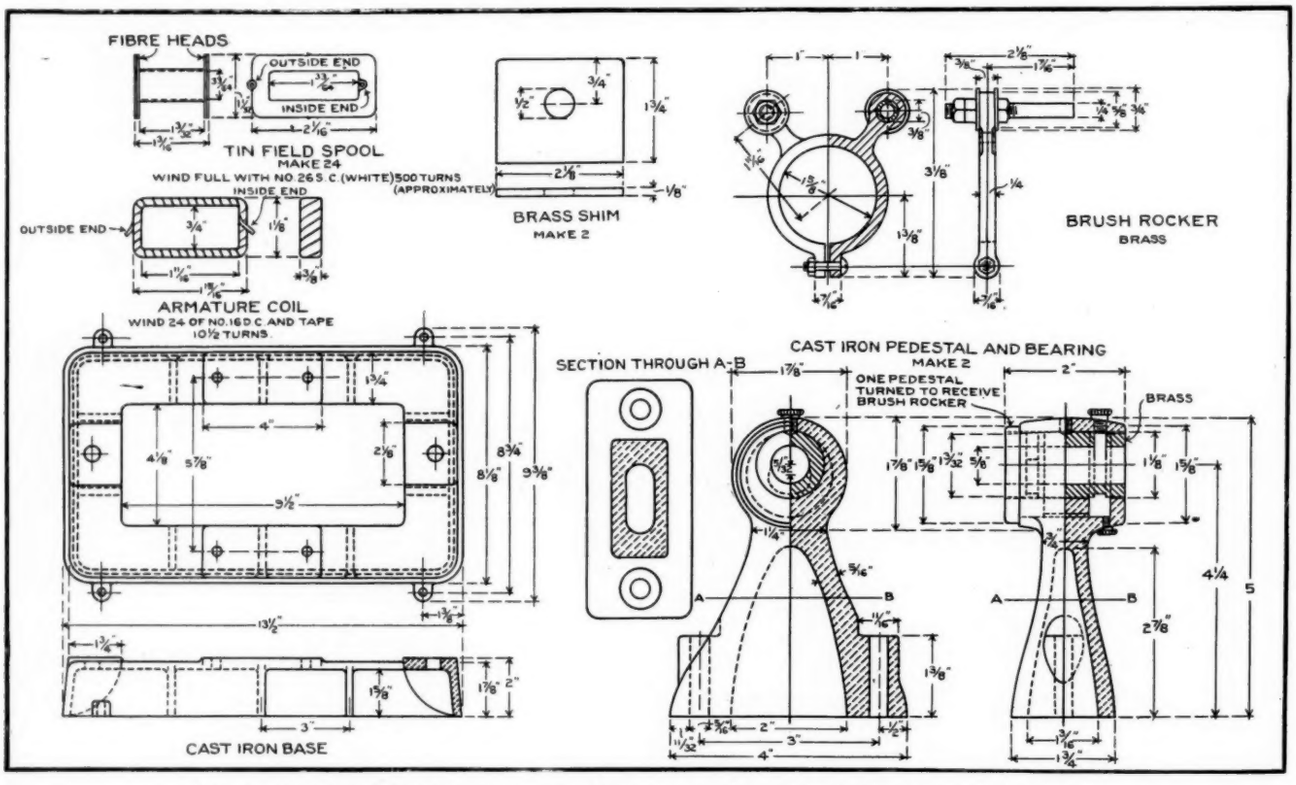


Fig. 3. Base, Pedestals, Bearings and Details of Experimental High Frequency Alternator.

The dimensions of the field cores and the armature were so chosen as to give low flux densities; Fig. 1 shows the design of the field ring, and Fig. 2 the design of the armature, including the spider, shaft and collector rings. The

chosen diameter of the armature gives a peripheral speed of 3,140 ft. per minute, at 1,500 revolutions and allows for a safe maximum speed of double the rated speed. The chosen diameter of armature is also such as to require field pole pieces of convenient width and depth, at a low magnetic density. Of the total reluctance of the magnetic

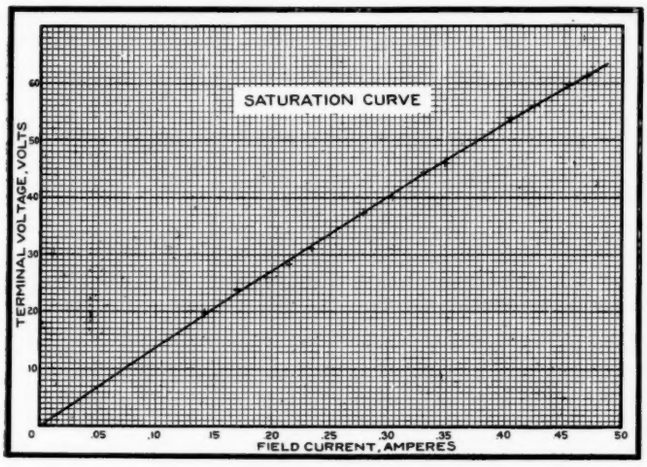


Fig. 5. Saturation Curve from Data Obtained.

circuit, 80 per cent or more, exists in the air gap. In the present design it was found best to make the gap rather small in order not to make the field windings unduly large or expensive. Therefore, one thirty-second of an inch was chosen as being the smallest space consistent with safe mechanical clearance at high speeds.

The various dimensions of the machine being chosen with due regard for low magnetic densities, the following actual densities, in flux lines per square inch, were used in the calculations of ampere-turns necessary in the field windings.

Field cores	16,400
Field yokes	11,700
Air gaps	12,680
Armature cores	7,300
Armature teeth	10,000

The necessary ampere-turns of field strength was calculated for each portion of the magnetic circuit, from the well known formulae given in text books on design, and the results were as follows:

Air gap	124
Field core	18
Field yoke	8
Armature	2
Total ampere turns	152

The values of magnetic permeability were taken from average curves for cast iron and sheet iron. The nearest size of single-cotton covered copper wire which will give the required ampere-turns when wound upon the field spool shown in Fig. 3 and energized with .25 ampere is No. 26 B. & S. guage. Theoretically this size will give 516 turns; the calculated resistance of 24 field spools in series was 216 ohms, thus giving .53 amperes when energized from a 115 volt source. The field current will be diminished somewhat as the windings rise in temperature. The watts lost in each spool at a half-ampere of current will be 2.25, and this amount of energy radiated from the surface of the spool winding, which is 6.5 sq. in., will not cause an undue rise of temperature; the rate of radiation is .35 watt per square inch of radiating surface, which is a safe rate for stationary windings. The temperature rise in the armature will be very moderate; the calculated armature resistance is .4 ohm.

The number of turns in each armature coil was increased from 10 to 10½ turns, in order to bring the terminals out upon opposite sides of the coil, and thus improve the insulation. In the machine which was built, only 9½ turns could be made in each coil, owing to lack of space caused by the room required for the insulation of the coils in the slots, which was a little greater than anticipated. Fig. 3 shows the base, pedestals, bearings, brush rocker, field spools and details. The field ring or frame is separated from the base casting by brass shims, which serve to prevent the establishment of a closed magnetic circuit through the base and also to adjust the alignment of the armature in the centre of the field ring. The bearings are self-oiling and self aligning. The oil wells are provided with an outlet so that they may be drained; the self-alignment is secured by tapering the bushings from the middle toward each end, to form a double cone, base to base; the bushing is held in place by a pivot which is screwed down through the top casing of the bearing. This method of securing self-alignment avoids the spherical seat sometimes used and the necessity for truing down a spherical surface, and also obviates the necessity of splitting the outer case of the bearing, since the taper bushing can be slipped into place from the end of the bearing. Fig. 4 shows the assembly of the entire machine.

One of these machines was constructed for approximately $200 and was subjected to several tests to determine its agreement with the design. The fields were excited from a 115-volt lighting circuit, through a suitable rheostat for varying the current. The machine was driven at varying speeds, up to 3,000 revolutions per minute. Two test runs were made, one for determining the saturation curve and one for determining the load characteristic. A saturation curve expresses the relation between the voltage at no load and the field current, at constant speed, while the field current is varied from zero to a maximum. The character of the curve indicates the correctness of the calculations of the magnetic circuit and the field windings. In making such a test the machine should be driven at constant speed, as near the rated speed as possible, and observations made of voltage at the brushes, the field current, and the speed, while the field current is increased step by step from zero

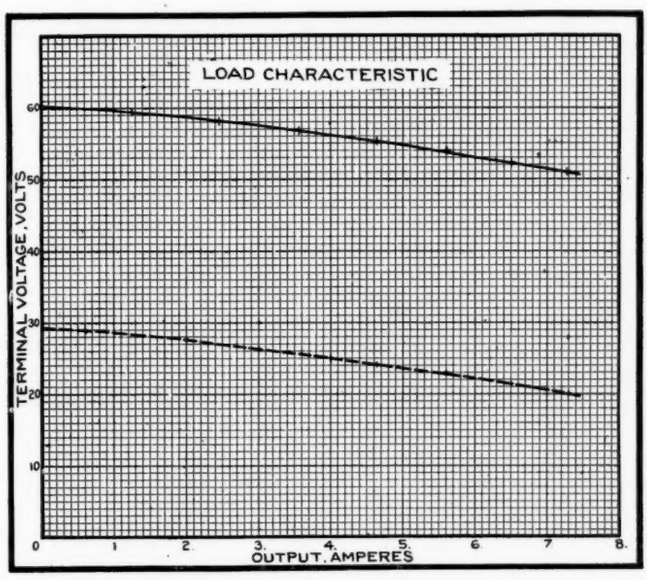


Fig. 6. Load Characteristic for High Frequency Alternator.

to a maximum. The details of this run are given in the table on the next page.

The voltage readings have been corrected to the value which they should have had if the speed had been 1,500 revolutions; an average speed of 1,590 revolutions was assumed in making the corrections. The curve in Fig. 5 is plotted from the first and last columns of data, given in the

table. It is substantially a straight line, and indicates the low values of magnetic density which were employed.

A load characteristic is a curve which expresses the relation between the amperes of output and the voltage at the brushes, at constant speed and field excitation. In making a test run to obtain data for this curve, the machine should be driven at constant speed and observations made of the current output, the voltage at the brushes, the speed and the field current. The field current should be kept constant. The details of this run are given in the following table:

Field Current, Amperes.	Terminal Voltage, Volts.	Current Output, Amperes.	Speed, R. P. M.	Terminal Voltage Corrected For 1500 R. P. M. and .46 Ampere Field Current.
.464	64.5	0.00	1591	60.3
.462	62.8	1.255	....	59.3
.462	61.2	2.438	....	58.2
.461	59.3	3.570	1562	56.8
.460	57.1	4.632	....	55.2
.460	55.5	5.600	....	54.0
.460	53.6	6.492	....	52.5
.460	51.8	7.266	1524	51.0

Data for Load Characteristic.

The voltage readings have been corrected to the value they should have had if the speed had been constant at 1,500 revolutions and the field current constant at .460 amperes. The load was made up of incandescent lamps, and was, therefore, non-inductive. Fig. 6 shows the load characteristic plotted from the first and last columns of data given in the table, represented by the upper or solid line in the figure. The voltage at full load rises, upon removal of the entire load, about 8 per cent, and this may be considered good regulation for so small a machine. On inductive load the percentage would be greater and the regulation therefore poorer. The lower curve is identical with the upper one, except that it has been lowered so that the voltage at full load is 25 volts, and represents the probable position of a curve plotted from data secured on a test run with the field strength reduced sufficiently to give 29.3 volts at no load. The field resistance measured after these runs, while it was hot, was 246 ohms.

Owing to the very small air gap between the armature and the field poles, slight inaccuracies in the machine work

Field Current, Amperes.	Terminal Voltage, Volts.	Speed, R. P. M.	Terminal Voltage Corrected For 1500 R. P. M.
.000	0.00	1592	00.0
.142	21.0	....	19.8
.170	25.0	....	23.6
.195	27.5	....	25.9
.215	30.0	1594	28.3
.234	33.0	....	31.1
.278	39.5	....	37.3
.304	42.5	....	40.1
.330	47.0	....	44.3
.349	49.0	1585	46.2
.375	53.0	....	50.0
.405	57.0	....	53.8
.425	59.5	....	56.1
.455	63.5	....	59.9
.467	65.0	1589	61.3

Data for Saturation Curve.

while boring out the fields or turning down the armature, may result in changing the gap by quite a percentage. A decrease of .005 inch in a gap of 1/32 inch, or .3125 inch, amounts to 16 per cent and would result in raising the voltage at the brushes, at no load, 19 per cent over the calculated value, assuming the design to be otherwise accurate and correct. Very precise machine work is necessary for a close realization of the designed voltage and output under the rated conditions. No accurate measurement was made of the air gap of this machine, but it was known to be approximately as designed. The performance of the machine in mechanical respects was very satisfactory except at speeds of approximately 3,000 r. p. m., when there was a little vibration. It is believed that this was due to the relatively large weight of the revolving parts with respect to the fields and the base.

The machine was also tried out as a source of current for delicate measurements of apparent resistance and inductance of telephone apparatus, with an induction balance, at various frequencies, but was found not to be well suited to such work owing to the distortion of the wave from the sine shape. In this respect an improvement could be secured by using a distributed winding in a larger number of slots per pole. The presence of iron in the armature, however, is believed to make it almost impossible to generate a pure sine wave of electromotive-force

Why Farmers Located Midway Between Telephone Exchanges Should Pay Highest Rate.

Fairness is a fundamental element of the character of the average western farmer. The response made to the argument of a telephone man in a recent situation which might have been embarrassing shows that time spent in setting forth the features of a condition which will demonstrate its justice to the farmer is not wasted. An Iowa manager tells the following experience:

"After driving ten miles in a pouring rain I faced a school house full of farmers. We met because they had sent a representative forty miles by rail to tell me they were going to build their own line, and refuse to buy our farmers' lines in their territory, unless we reduced our rural rate from $15 to $12.00.

"My only argument was that we really needed the money, were anxious to serve them satisfactorily and wanted to know what they considered the fairest way of handling the business. I drew on the blackboard a diagram showing three towns, which were an equal distance from the school house in which we met.

"I then told them how they had originally bought their land $10 an acre cheaper because of its being farthest from town, and therefore had to their credit $1,600 to each quarter section, as contrasted with their neighbor, who lived within a mile of either of the three towns. The interest on this $1,600 at six per cent left them a balance to their credit of $96.00 per year. Then the point was made that they were now asking rural free delivery and the telephone, not merely to move them into the corporate limits of one town, but into the corporate limits of all three of the towns, for talking purposes. They knew from actual experience that the grain buyer and the stock buyer in each of the three towns got them the top notch quotation whenever they telephoned for prices, and that he did this because he realized that they were within talking distance of his two competing towns and could haul to any one of the three places more easily than their neighbor, who was originally more favorably, but now, by reason of the telephone having come in, less favorably situated.

"I asked them whether they thought it would be fair for the man midway between three towns to be given connections with three exchanges at the same rate that the man within a mile of any one of the towns paid for one town. In reply, they expressed themselves unanimously as considering it unfair. They expressed it as their sense of fairness that an additional charge should be made for each additional town to which the man was given access. They also expressed it as their sense of fairness that the trunking service should be on a mutual basis or message rate plan between exchanges, as far as practicable, and they consented unanimously to a continuance of the $15.00 rate, because it gave them two towns."

Experts Report to Massachusetts Commission on New England Telephone Property

On April 5th the Massachusetts Highway Commission transmitted to Governor Eben S. Draper the report submitted by Dugald C. Jackson, of the firm of D. C. & Wm. B. Jackson, who have conducted an elaborate inventory and appraisal of the property of the New England Telephone and Telegraph Company in Massachusetts. The object of this investigation was to provide data by which the commission might determine whether existing rates are equitable, and if not, what change should be recommended by the Commission by virtue of the regulative powers which it is given by the laws of the State.

Following is the letter which the Highway Commission wrote to the Governor in transmitting the report:

April 5, 1909.

To His Excellency, Eben S. Draper, Governor,
State House, Boston, Mass.

Sir:—The Massachusetts Highway Commission and the experts employed by it have been engaged for the past year in securing a careful inventory and apraisal of all property of the New England Telephone & Telegraph Company. The scope of the work was not limited to Massachusetts, but, at the request of the company, the appraisal was extended to include its property in Maine, New Hampshire and Vermont.

This appraisal has involved an immense amount of labor, including the counting, measurement and tabulation of all the poles, wires, conduits and every other item of equipment, the placing of a value upon each unit and computing the results. The company has co-operated most heartily, and at one time had over two hundred people at work.

This work is now completed and the values of the property have been tabulated and classified so that it is possible not only to determine the value of any part of the plant which the company owns in any given locality, but also the value of the plant that is used in connection with each class of service.

The appraisal, showing as it does the actual value of the plant, is probably adequate and sufficient to enable the commission to determine, after a full consideration of all the details and factors entering into the problem, what gross revenue the company is fairly entitled to collect from the telephone users in justice to its stockholders and to the public.

The commission believes it to be of paramount importance that all unequal and discriminating rates of every nature should be done away with as rapidly as possible. Last year the commission submitted to the company a recommendation to that effect, and it is believed that the company is conforming to that recommendation as fast as existing contracts will permit.

It is almost equally important that the rates for service in the various localities and for the various classes of service should be so adjusted as to make them fair, not only to the public in general, but to each locality and to each class of telephone users, and this is the result which the commission hopes to accomplish.

As the result of a preliminary study, the board last year recommended to the telephone company that the toll rates between Boston and sixteen suburban exchanges within a five mile radius should be reduced from ten cents to five cents. This recommendation was made and acquiesced in by the company's officials, who immediately put the new rates into effect. While the gross revenue from this service was, of course, at once cut in halves, it has gradually increased until t day the total amount collected from this source is a very considerable proportion of the amount collected before the rate was reduced. It is impossible to tell, as yet, what the increased cost of this increased business is, but the commission hopes that all such matters may be determined hereafter.

The commission is now satisfied that in order to do full justice to all the users of the telephone in the various localities, a further comprehensive study is necessary. Traffic studies should be made, costs of operation, the amounts that should be allowed for repairs, replacements, construction and reconstruction, and what items and amounts should be charged to capital and what should be paid for from the rates must be determined to ascertain what rates are fair and reasonable in the various localities and for the various classes of service, both toll and local.

If the telephone rates, as a whole, can be placed once for all upon a fair and equitable basis throughout the state, in every locality and for every class of service, all future changes which may be necessary can be made by increasing or diminishing the gross revenue by a uniform reduction or increase in the rates.

The appraisal before referred to seems to show that the gross revenue collected by the company in the past has been sufficient to make a proper allowance for reconstruction and replacement. It seems probable that further reductions can be made in the amount of gross revenue collected without injustice to the company, but in order to determine where any changes in the rates can be made and how the rates should be adjusted, between the various localities and the various classes of service, much more study of the workings and processes of the company will be required.

The board feels that this work should be done under the direction of the commission and by an expert or experts employed by it and not connected with the telephone company. This appears to be necessary not only to insure the collection of the proper data, but also so that the data collected shall be so classified as to be of the greatest possible use in any future studies of traffic and rates which may be made.

The appraisal already made has practically exhausted the appropriation authorized under Chapter 102 of the Resolves of 1908, and as there appears to be no money available for future investigations so complete as above outlined, the commission, in a letter dated March 31, 1909, stated the facts and its conclusions to the president of the company, Thomas Sherwin, Esq. A copy of this letter and of the reply of the company thereto, dated April 1, 1909, are enclosed.

The company agrees with the commission that it is advisable that these data should be collected, tabulated and properly studied, and also agrees that it will co-operate in every way with the commission and its experts, as it has done so cordially in the past. It agrees further that the cost of this work, if paid for in the first instance out of the treasury of the Commonwealth, shall be repaid to the Commonwealth by the company in the same manner as was the cost of making the inventory and appraisal under Chapter 102 of the Resolves of 1908.

Professor D. C. Jackson, an expert retained by the commission, in his report to the commission dated March 27, 1909, says that to have this work done in a complete and comprehensive manner an appropriation of a sum not exceeding $35,000 is necessary to pay for the services of the expert engineer and the expert auditors and accountants who will have to be employed, this sum being in addition to any sum or sums heretofore appropriated for the use of the commission.

The commission feels that the New England Telephone & Telegraph Company should bear, ultimately, the whole expense to which the commission may be put in the matter, and that the company should pay into the state treasury the sum above mentioned, in the manner provided by the Resolve of 1908 before mentioned.

The commission further requests, since it is now too late for the introduction of any new business before the legislature, through the usual channels, that if it appears to you to be expedient, you will make this matter the subject of a special message to the legislature, so that a resolve may be passed substantially in the same form as that of last year.

A copy of the report of Professor Jackson, giving much more fully the reasons for the comprehensive investigation herein outlined, is sent to you herewith, and the commission will be pleased to make any further explanation of this matter which you desire.

Yours respectfully,
(Signed) Harold Parker, John H. Manning, Wm. D. Sohier,
Massachusetts Highway Commission.

The following letter indicates the attitude of the company under investigation, as expressed to the Highway Commission:

A. B. Fletcher,, Esq., Secretary,
Massachusetts Highway Commission,
15 Ashburton Place, Boston, Mass.

Dear Sir:—I am in receipt of your favor of this date, informing me that Prof. Dugald C. Jackson has advised the commission that further studies of traffic and other statistics relating to the operation of this company are desirable, in order that the commission may reach conclusions respecting the various classes of service furnished to subscribers of the company, and the public making use of the system, and the proportionate rates and charges applicable thereto.

Replying to your inquiry, I beg to say that the company desires to co-operate to the fullest extent in our power, in the work which the Massachusetts Highway Commission are prosecuting, and in obtaining and formulating all information which may be considered essential or valuable for the purposes which the commission have in view.

With respect to the sum of $35,000 which it is estimated will be required for the further investigation of the subject, the same arrangement as that provided in Chapter 102 of the Resolves of the General Court of 1908, namely, that the New England Telephone & Telegraph Company is to reimburse the Commonwealth up to the amount named, will be entirely acceptable to the company.

In conclusion I desire to say that it is gratifying to us to know that the results of the inventory of property and the studies of statistics already made have proved of value and satisfactory to the Highway Commission.

Very respectfully,
(Signed) Thomas Sherwin,
President, New England Telephone & Telegraph Company,

Following is the full text of the report by Prof. Jackson: The Honorable Massachusetts Highway Commission.

Gentlemen:—We herewith give you a summary report of the results of the inventory and appraisal of the property of the New England Telephone and Telegraph Company that has been executed for you under our supervision.

You will find at the end of this report a table marked Exhibit 1, which shows the extent of the plant of the New England Telephone and Telegraph Company within the Commonwealth of Massachusetts, according to the actual count of the inventory made last midsummer. This table shows the plant divided into different kinds of property, and gives the extent of each. The company has 247 exchange central offices which provide telephone service for substantially every part of the Commonwealth. Of these central offices 46 are housed in buildings owned by the company, while the company owns seven other buildings in the Commonwealth which are used exclusively for storage or general purposes. The number of operators' positions at exchange switchboards, which aggregate 2,367, gives a truer idea of the extent of the telephone switchboards throughout the Commonwealth than is obtained from a consideration solely of the number of central offices.

This table represents a summary of the results of the inventory of the telephone company's property, and strikingly displays the magnitude and comprehensiveness of the system in this Commonwealth and the extent of each kind of plant, but the inventory dealt with a mass of details of which the table gives only a faint idea, and which are on file for use as may be needed in further studies of the telephone situation.

It will be seen from the table that the length of telephone conductors in the Massachusetts system is sufficient to provide nine complete metallic circuits of two wires each entirely around the equatorial circumference of the earth, and still leave a little over, and that the other quantities found by the inventory are of correspondingly great magnitude.

In Exhibit 2, appended hereto, is given the total value of property of the New England Telephone and Telegraph Company relating to its business within the Commonwealth of Massachusetts, divided to correspond with the divisions of plant shown in Exhibit 1. In Exhibit 3 is given the value of the company's property relating to its business in the adjoining states.

The value given for each kind of property in Exhibit 2 includes the values of all the collateral materials that appropriately accompany the particular main division. For example: Substation equipment includes all the cost (including installation labor) of the material and apparatus in the subscribers' stations installed ready for service; poles and fittings include all the cost of the poles suitably prepared with their cross arms, pins and hardware, set in place ready to receive the insulators; aerial cables include the cost of the cables properly spliced, together with the messenger cables and hangers for carrying the conducting cables, the pole clamps, and the terminal boxes that are a part of the aerial cable distribution, all in place ready for service; and so on throughout the entire property.

Our appraisal shows that the total value of the physical plant used for local service in the Commonwealth of Massachusetts is $22,885,082. This is the portion of the plant that is made use of to provide local service between subscribers whose circuits emanate from the same individual exchange central office, except that the seven central offices of Metropolitan Boston are considered as the equivalent of a single exchange central office.

The foregoing total for local plant is divided in the following manner between certain important divisions of the Commonwealth:

The total value of local plant in Metropolitan Boston is $4,463,843.

The total value of local plant in the Suburban District surrounding the Metropolitan part of Boston is $6,446,838.

Of the latter total, a value aggregating $3,983,940 lies within the inner zone now receiving five cent toll service with the Metropolitan District.

A value aggregating $2,462,898 lies in the outer zone now receiving ten cent toll service with the Metropolitan District.

The total value of local plant in the eleven cities of the Commonwealth which, besides Boston, are of substantially 50,000 inhabitants or over, is $6,872,411. These eleven cities are: Brockton, Cambridge, Fall River, Holyoke, Lawrence, Lowell, Lynn, New Bedford, Somerville, Springfield and Worcester.

The remainder of the local plant in the Commonwealth is required for service in the smaller cities and rural districts and its value amounts to $5,979,248.

In these divisions of local plant, the property in Cambridge and Somerville comes into the total for the Suburban District and also into the total for the eleven cities.

The total value of the toll plant for use in affording intercommunication between subscribers connected with different central offices is $9,641,913. It will be observed that this is a sum equal to forty-two per cent of the total local plant.

The average net current assets and cash on hand which enter into the capital of the telephone company amount to $1,560,000, as obtained from figures supplied to us by the auditor of the company. This amount represents the funds that are required in the current operations of the company, and is added to the values of physical plant in Exhibit 2.

There are (as of the period of the inventory, namely, midsummer, 1908), 42,749 telephones in use in Metropolitan Boston; 34,888 in use in the inner zone of the Suburban District; 19,456 in use in the outer zone of the Suburban District; 56,729 in use in the eleven aforesaid cities, and 54,540 in use in the remainder of the state. These may be distributed in a different classification as follows:

20,201 main telephones, 17,143 private branch exchange terminal telephones, and 5,405 extension telephones connecting with 19,159 subscribers' circuits in the Metropolitan District.

29,672 main telephones, 2,519 private branch exchange terminal telephones, and 2,697 extension telephones connecting with 16,556 subscribers' circuits in the inner zone of the Suburban District.

16,875 main telephones, 702 private branch exchange terminal telephones, and 1,879 extension telephones connecting with 8,770 subscribers' circuits in the outer zone of the Suburban District.

45,516 main telephones, 5,113 private branch exchange terminal telephones and 6,100 extension telephones connecting with 23,581 subscribers' circuits in the eleven cities.

And 48,558 main telephones, 1,892 private branch exchange terminal telephones, and 4,090 extension telephones connecting with 19,399 subscribers' circuits in the remainder of the Commonwealth.

We here use the term main telephone to represent any telephones except extension telephones and private branch exchange terminal telephones. The ratio between the number of main telephones and the number of subscribers' circuits shows the average number of main telephones per subscriber's circuit, or as it is usually thought of, the average number of subscribers per circuit. The inventory shows in detail the number of each kind of circuit and each kind of telephone for each of the 241 sections of the state, comprising the Metropolitan District of Boston and 240 central office exchange districts outside of the Metropolitan District.

The data gathered are in great detail, and the figures here given are a summary of the whole. The inventory and appraisal, which have been made with exceptional care, show how much property the company possesses within Massachusetts and outside thereof, its distribution over the Commonwealth, its value, and the distribution of the value throughout the Commonwealth. It shows that for each $100 worth of property the company has outstanding $83.67 of par value in stocks, bonds and notes. The aggregate value of the entire property of the company and a comparison of this value with the total outstanding securities of the company are shown in Exhibits 4 and 5 hereto appended. From this relation of the appraised value of the property to the par value of the company's securities, we infer that the company has been in the habit of paying for such expenses as engineering, interest, and like expenses pertaining to new construction, out of earnings instead of out of the capital account. The appraisal shows beyond dissent that the company now has no water in its securities, and the discrepancy in the other direction constituting 16.3 per cent of the total value of the property is still small enough to cause no concern. Whether the company's existing method of putting the cost of new construction on its books should be continued is a matter which your honorable body may wish to consider. To give this a full consideration, we believe that suitable accountants should be associated with your engineers.

The appraisal affords information on which your honorable body can decide how much money the company should be allowed as return on its investment, and how much it should be reasonably expected to expend on the average per year for reconstruction for the purpose of maintaining the plant, against the ravages of age or the obsolescence incident to inventions and other causes for improvements and changes in the art. Whether the return on investment is ultimately to be figured on the outstanding stocks and bonds of the company or on the value of the plant, the sum that must be allowed for reconstruction is unquestionably determined by the actual existing values of the different kinds of property composing the plant, which values are shown by the appraisal.

This reconstruction is called for on account of several factors. The rotting of poles so that they must be replaced, the deterioration of conduits, cables and wires so that they must be replaced, and the other effects of the elements and of use on every part of the plant ultimately bring nearly all parts of the telephone plant to a point where their further use is impracticable without rebuilding, however well cared for and carefully kept up by current repairs they may be. The part of the plant affected must then be bodily replaced. The advances occurring through improvements in the art also make an important factor in the telephone business which demands the remodeling or the bodily replacing of parts of the plant from time to time before their natural life is run. A third factor is introduced by the action of municipal and other public boards who may order improvements of streets and roads, as by ordering good pole lines removed to alleys or wires placed underground. None of these factors can be cared for out of a uniform appropriation such as may cover ordinary repairs; and the cost of making good after special attacks of the elements, such as damage of pole lines from sleet storms, the effects of forest fires, etc., is still more capricious in its occurrence. Nevertheless, these expenditures must be made out of current receipts year by year or the capital of the company is bound to become impaired. For this purpose, the average rate of reconstruction likely to be required over an extended period of years must be figured on the basis of experience, and a corresponding sum of money should be set aside each year to be expended in reconstruction of operating plant as the conditions require it. Less than this amount may be used in some years and more in other years, but the amount to be taken from the gross receipts each year for this purpose should be fixed upon an average determined by the extent and value of each kind of plant in the complete system. As a result of our study of the complete plant, we have applied percentages to each kind of construction involved, giving consideration to first cost, rate of depreciation, probable effects of rate of changes in the art and the acts of municipal bodies, special misfortunes caused by the elements, and also giving consideration to any salvage that might be recovered from discarded plant. The consideration of these various factors is based on experience in telephony and electric lighting of the past and as much judgment of the future as may be brought to bear. In this way we arrive at a figure for the average yearly reconstruction account for the property used in Massachusetts business, which is equal to 7.3 per cent of the value of such property exclusive of land, general supplies, and working capital (net current assets and cash on hand). This makes a sum to be thus annually taken for reconstruction purposes in Massachusetts which amounts to $2,240,000 on the existing plant. A detailed table will accompany our full report.

From the company's expenditures for current repairs and reconstruction for the whole of its system, including the plant in the adjoining states, as reported to us by the company's auditor for several years past, we are led to conclude that the company is not making charges to reconstruction at a higher rate than our estimate; and it therefore seems proved that the company is not building extensions out of annual receipts under color of the reconstruction account, and our exacting inspection of the plant leads us to say that the company is maintaining it in excellent condition.

The knowledge gained by the appraisal added to the company's records of annual operating and repair costs, puts your honorable body in possession of standards by which to measure the reasonableness of the total sum annually collected by the company from its subscribers. This was a principal aim of the appraisal of the property and has been accomplished.

At your request we have been recently studying the company's rate schedules along with the appraisal data, and we believe that improved schedules can soon be reported to you for the Boston and Suburban District. The appraisal seems to us to indicate that the rates in the Metropolitan District of Boston may be examined and revised with advantage to the subscribers and without injury to the company's stability. Rates for service in the Metropolitan District, however, are closely associated with suburban rates, and changes in one set cannot be safely made without a full consideration of the effect on the other.

As pointed out in our report to you of March 10, 1908, traffic data must be gathered and properly apportioned, and operating and repair cost records made before it is possible to get a comprehensive or, in fact, a reasonably satisfactory opinion of the soundness with which the total sum annually collected by the company is apportioned amongst the various localities and kinds of communities in the Commonwealth. The company has gathered traffic data since our preceding report, especially with respect to the Boston and Suburban District, which will be of service, but we believe that fuller traffic data and apportioned cost records must be gathered and studied with extended care before recommendations in regard to this very important point (the company's relative treatment of localities and classes of customers) can be put on a firmer foundation than the foundation which has apparently been heretofore utilized, namely, business expediency and the best personal judgment of the company's officers.

The large and growing business of the company shows

that the judgment used by the company in the past has worked well; but study of the service, traffic, and rates, shows undeniable eccentricities in the company's existing development. We believe that our progress thus far shows that careful and full study of traffic rates and costs will bring the desired end of a more satisfactory means of comparing the company's treatment of different localities in the Commonwealth.

The great importance of a full and comprehensive telephone service and the large part which the telephone plays in the business welfare and social convenience of the Commonwealth make us believe that the expenditure for a full study of traffic, rates and costs should be made. The company ought to coöperate in such work by adding the judgment of its best experts, but we believe that your honorable body ought to receive your advice through suitable engineers and accounts who are independent of the company.

As aforesaid, in our opinion, suitable accountants may wisely be associated with your engineers, and an early part of their joint duty should be to plan in coöperation with the company means of record keeping that will afford data for more effectually determining from time to time the effect of any changes of rates or subscribers' privileges which may be made. We look upon this as of primary importance. The company's records do not seem now to be sufficiently refined for the purpose. For instance, the company's present records do not seem to be capable of affording as full an exhibit as seems to us desirable for your information of the effects on the company's investments, gross earnings, and the cost of caring for the traffic, which have resulted from the change in the rate of tolls in a portion of the Boston and Suburban District which the company put in effect nearly a year ago at the recommendation of your honorable body.

Additional complexity is imported into the rate question by the relations of the toll service to the local service. In order that local rates may be reasonably adjusted, it is desirable that they shall not be entangled with the cost of the long distance (toll) service of the company, and the valuation of the toll plant should, therefore, be separated from the valuation of the local plant as far as practicable. This is equally necessary for a satisfactory consideration of toll rates. This principle, as indicated by the figures given earlier, has been carried out in our appraisal. The long distance toll system probably might be expected to earn its own operating expenses, reconstruction charges and return on the investment, independently of the receipts for local service, but we are not convinced that it is now doing so. In fact, figures for gross receipts seem to indicate the contrary. In case it is not doing so, it manifestly must be carried by the subscribers in general or by some particular classes of the subscribers. This needs further study of past records of traffic, receipts and expenditures, and also study more particularly based on additional records of traffic, gross receipts and expenditures kept with a fuller separation of the records for toll service from the records of local service. Such separation has been quite incomplete in the past.

In the inventory and appraisal, wires used for toll purposes are separated from those used for local service, and the supports or conduits are apportioned to toll and local plant in proportion to the actual toll and local wires carried. The values of central office equipment and land and buildings owned by the company are also apportioned between local service and toll service on actual service requirements.

In the outlying portions of the Commonwealth the difference between what may be appropriately considered toll plant and what may be considered local plant is clearly marked, as each exchange central office provides local service to a more or less distinct community, but in the Boston and Suburban District the apportionment of plant between toll and local service is much more difficult.

Owing to the closely inter-related character of the sections of Metropolitan Boston which includes the central offices called Back Bay, Fort Hill, Haymarket, Main, Oxford, Richmond and Tremont, we have considered the connecting circuits between these seven central offices as a part of local plant. We have thus considered these seven central offices, tied together as they are by connecting trunks, as the equivalent of a single exchange central office. In the Suburban District, however, we have considered as toll circuits all circuits which pass from any suburban exchange to any other exchange, following our practice in inventorying the plant in the remainder of the Commonwealth. We believe that this is a reasonable and fair way to make the assignments. Our inventory and appraisal also show the extent and value of all circuits connecting between central offices separately from the circuits extending from subscribers to central offices, so that the appraisal gives data for correcting the apportionment in case further study should indicate a desirability of changing this part of it.

The inventory and appraisal show the distribution of the property of the company through the Commonwealth, and they also show this distribution separated, as between local plant and toll plant, thus laying the foundation for a study of local rates and of toll rates separately in each part of the state.

The only means of obtaining this separation was an inventory and appraisal, and we believe that the apportionment is satisfactory as made.

The data obtained from the inventory and appraisal do not, however, include information about the company's expenditures for operating and repairs; and these ought to be carefully studied and means devised for maintaining records which will be of an analytical character, and will lend themselves to apportionment between the local and toll service. Plans should also be developed to maintain the plant valuation on a basis of appropriate continuous records.

To carry out the additional work to which we have referred, and which we believe ought to be carried out for the purpose of putting the Highway Commission in possession of adequate grounds for recommendation of rates as required by law, an additional appropriation will be needed. The appropriation now being used was made according to an estimate of the expense attendant upon planning and supervising the inventory and appraisal. It will be substantially exhausted by that work, though we expect to have some additional results in the way of proposing an improved rate schedule for the Metropolitan District to accompany or precede our final report.

Of the money expended under the appropriation for planning and supervising the inventory and appraisal of the property of the New England Telephone and Telegraph Company, $9,600 has so far been paid to D. C. & Wm. B. Jackson as professional fees. The remainder expended out of the appropriation has been used to defray the expense accompanying the making of plans, the checking of inventory figures, and reducing the data to form convenient for a report to your honorable body and such further use as you may desire. The aforesaid expense has been largely made up of salaries and wages of inspectors, draftsmen, checkmen, etc.

We have not yet placed in your hands the great mass of maps and figures that comprise the inventory and appraisal of the plant, as we have recently had a force engaged in accordance with your directions in gathering statistics and other data relating to the matter of rates, and we have consequently delayed placing in your hands the completed

report until the Boston and Suburban rate question is ready for your consideration.

To execute your wishes as expressed to us will require carrying out in full the various branches of investigation set forth in the foregoing. We estimate that the additional which should be available for expenditure by your honorable body in order that these requirements shall be met is $35,000. This ought to cover the cost of engineering and accountants' work as outlined. We believe that provisions may be made with wisdom to extend the work over not less than one year with the expectation of utilizing its results in the readjustment of rates from time to time as the data may warrant. We make our estimate of the expense of the work on the basis of first arranging for adequate traffic and cost data, to be followed by careful study continuing for a satisfactorily extended period so that the traffic and cost records may be sufficient to draw reasonably reliable conclusions. It is also desirable that the effect of any changes proposed for the rates of the Boston and Suburban District should be carefully studied jointly by the engineers of the company and the Commission before being put into force, and thereafter as to their effect on traffic and earnings.

Respectfully submitted,

DUGALD C. JACKSON.

Inventory of Property of the New England Telephone & Telegraph Company.

Table Showing the Extent of the Plant in the Commonwealth of Massachusetts.

Number of buildings owned by company	53
Parcels of land owned by company	54
Number of exchange central offices	247
Number of operators' positions at exchange switchboards	2,367
Length of pole lines (approximate), miles	3,837
Length of pole lines (approximate) feet	3,100,901
Length of underground conduits, miles	587
Length of underground conduits, feet	14,370,649
These comprise underground ducts, miles	2,721
Number of manholes in underground conduits	11,217
Aggregate length of pole lines and conduits, miles	4,424
Length of open wire on pole lines, miles	67,599
Length of open wire on pole lines, feet	5,264,160
Length of aerial cable, miles	997
Length of conductors in aerial cables, miles	66,836
Total length of overhead conductors, miles	134,435
Total length of overhead conductors, feet	6,663,360
Length of underground cables, miles	1,262
Length of underground cables, feet	52,400
Length of submarine cables, miles	10
Length of conductors in underground and submarine cables, miles	318,225
Aggregate length of aerial, underground and submarine cables, miles	2,269
Aggregate length of telephone conductors in all cables and wires, miles	452,660
Number of poles	310,138
Number of subscribers' telephones on Aug. 31, 1908	199,382

Appraisal of Property of the New England Telephone & Telegraph Company.

Table Showing Value of Property Belonging to Business Within the Commonwealth of Massachusetts.

Substation equipment	$ 3,217,240
Drop wires leading to subscribers' premises	668,315
Poles and fittings	4,260,173
Conduits and manholes	7,588,632
Wires on poles	2,724,017
Aerial cables	1,465,213
Underground and submarine cables	4,718,066
Switchboards	4,094,067
Furniture and tools	453,078
Land and buildings	2,344,469
General supplies*	1,040,000
Net current assets and cash on hand**	1,560,000
Total	$34,133,270

*Book value, from auditor.
**Round figure representing average condition.

Appraisal of Property of the New England Telephone & Telegraph Company.

Table Showing Value of Property Belonging to Business in Commonwealths Outside of the Commonwealth of Massachusetts.

Apparatus and equipment	$ 9,771,766
Lands and buildings	210,783
Investments in other companies*	1,945,000
Net current assets and cash on hand**	480,000
Total	$12,407,549

*At cost value, from auditor.
**Round figure representing average condition.

Appraisal of Property of the New England Telephone & Telegraph Company.

Table Showing the Division of Property Value Between That Belonging to Business Within the Commonwealth of Massachusetts and That Belonging to Business in Adjoining States, Together With the Total Value of Property.

Value of property belonging to business within the Commonwealth of Massachusetts	$34,133,270
Value of property belonging to business in the Commonwealths adjoining Massachusetts	12,407,549
Value of entire property of the New England Telephone & Telegraph Company	$46,540,819

Appraisal of Property of the New England Telephone & Telegraph Company.

Table Showing Value of the Property Compared with the Outstanding Securities of the Telephone Company.

Appraisal value of entire property of the New England Telephone and Telegraph Company	$46,540,819
Total par value of the company's outstanding stocks, bonds and notes, as given by the company's auditor, for August 31, 1909	38,939,850

Insurance of Telephone Property

One of the principal topics of discussion at the recent conference of managing officers of telephone companies held at Kansas City was insurance. This subject has been under investigation for some time, and it is probable that the time is near at hand when the work which has been prosecuted with care by Mr. James B. Hoge, of Cleveland, Ohio, and others, will be productive of conclusions resulting in a plan for putting insurance of all Independent telephone property on a more sound and economical basis.

The reason for this investigation will be apparent to every officer of a telephone company, not only from a review of his own experience, but from reading the paper read by Mr. Hoge at the last convention of the International Independent Telephone Association. At this time Mr. Hoge said:

"Some months ago the representatives of a number of telephone companies were together comparing notes on insurance, and, finding a wide discrepancy in forms and rates decided to investigate the subject and recommend the adoption of some plan that would solve the problem. A committee was appointed consisting of Mr. Chas. West of Pennsylvania, Mr. A. C. Davis of West Virginia and Jas. B. Hoge of Ohio. Your program committee has asked us to make a report to this convention and we beg leave to make the following report on 'Fire and Other Insurance.'

"Since the organization of the first fire insurance company in this country in 1752, which was organized by Benjamin Franklin and others, the question of insurance has been receiving special attention. Statistics show that insurance losses vary from 39 to 57 cents with an average of 48 cents on every $100 of insurance written.

"Out of 200 inquiries sent out some three weeks ago, 48 companies have made fairly complete reports. These 48 companies are operating 274,153 telephones in 15 different

states and operating 192 exchanges. The value of the buildings owned by them is $2,232,560, insurance carried on buildings $1,237,300. It is impossible to get at the average rate in the limited time and from the reports furnished. This seems to vary from 24 cents per hundred to $3.07 per hundred. Many of the companies have neglected to give the value of their switchboards. The insurance carried by these 48 companies on switchboards is $2,859,650. This rate varies from 78 cents per hundred to $2.85 per hundred, the highest and lowest rate being given in the same state. It is likewise impossible to get the average rate paid on this insurance. A large percentage of the companies are carrying fidelity insurance on which they are paying a wide variation of rates. A large percentage also carry employers' liability insurance which also has a wide variation of rates.

"Only five companies out of the 48 reported are carrying rental insurance, that is to say, insurance against loss of rentals in case any part of their exchange should be thrown out of commission. The amount of insurance as compared with the gross income of these companies seems to differ widely as does also the rate paid. This rate seems to vary from 25.7 cents per hundred to $2.50 per hundred.

"There has been paid out in the five years for losses $58,820.96, $28,159 of which was paid to the companies at Waco, Texas, and $15,044 to the company at Rochester, N. Y. Losses reported but not covered by insurance $11,313.70, Premiums paid during the same period by 47 of these companies, (one company not reporting) was $258,800. The amount of insurance carried on switchboards per telephone is $10.41.

"The question that seems to cause the greatest apprehension about telephone insurance is that of proper protection from electric currents foreign to the telephone business. There is probably no general line of business that takes greater precaution to guard their property against lightning and other high currents than the telephone companies. A well constructed telephone plant has two or more fuses on each line to protect its principal apparatus against such currents. These currents, were they not thus protected, would get into the cables, terminals and other property not ordinarily covered by insurance. Of course it must be admitted that there are companies that will be careless about this protection unless their attention is rigidly called to same from time to time. Should companies who are careful suffer for others' carelessness?

"One boiler insurance company had previous to January 1, 1903, made 1,815,465 inspections, total number of boilers inspected 3,568,838, total number of defects 2,559,592, dangerous defects 270,850, and 15,169 boilers were condemned as unfit for use. Total premiums paid in 35 years on boiler insurance nearly $25,000,000, total losses paid during the same period $2,500,000, or not to exceed 10 per cent, while the company spent during that same period from 60 per cent to 85 per cent of the premiums received each year for inspection. A great majority of the people insuring boilers rely more upon the four or more inspections made annually than they do upon the other features of their policies.

"The question now arises, can the telephone companies get better rates by inaugurating a system of inspection that will give them better protection from carelessness on the part of their employes? The moral hazard in a telephone property is practically nothing for the reason that on an average there is less than 25 per cent of the total equipment contained in the exchange buildings which is the property ordinarily insured.

"No line of business is probably better protected against fire than the telephone companies for the reason that there is some one on duty day and night, holidays and Sundays, and in case of fire the operator is in instant communication with the city or village fire department. No telephone manager or owner can have the least possible excuse for wanting a fire in his exchange, but on the other hand there is every reason why he does not want it. The goodwill and business of any exchange is a valuable asset. The serious problem about fire is that the public is immediately thrown out of service and this inconvenience is likely to drive them to rely on the telephone company's competitor and necessitates day and night work in order to get back on an operating basis, which means increased responsibility for the managers and owners. All modern exchanges are provided with immediate means for protecting the property without depending upon the fire department.

"Are we ready for telephone co-operative or mutual insurance the same as many of the manufacturing companies and other lines of business have adopted? One company coming to our notice which insures a line of business that has suffered greater loss from explosions than from any other cause has been assessing on an average of 50 per cent of the regular old line companies rates carrying 75 per cent of the value of the plant and installation and 100 per cent on contents. This company has a corps of regular inspectors who make it their business to see that these properties are kept in proper shape. They have paid their losses out of this 50 per cent fund and built up a very substantial surplus account.

"A factory insurance company which is organized under the laws of one of the New England states charges a certain rate per thousand of insurance, enforcing very rigid rules as to the use of safety appliances with a complete system of inspection of plants, charging full insurance rate. There is a dividend declared at the end of each year, whereby the money not expended that year is returned to the insurers, less a certain amount which is put into a reserve fund. I might add here that the boiler insurance people, not only make these inspections, but they also employ a corps of engineers and draftsmen who are constantly studying dangerous conditions with reference to the construction of boilers and suggest improvements to manufacturers or builders of boilers so as to avoid these weak points. Are we ready for the same kind of co-operation and suggestions?

"Another large manufacturing company, or so-called trust, carries its own insurance. It has a large number of plants scattered around over the country, has its own insurance department and sets aside a certain amount out of the gross earnings of the company each month. From this fund all losses from fire are paid in full. There is a corps of inspectors who visit each property not less than three times per year and as much oftener as they can get around to it or find it desirable to do so. They not only look after the property to see that it is properly maintained but suggest improvements that might be made to lessen the fire risk. In case these improvements can be made at a reasonable cost, the managers of the various properties have it done at once, if it cannot be, and the operating management has some improvement in mind that will probably necessitate the rebuilding of this particular property in the near future, he so reports to the insurance department and the matter is allowed to stand until the rebuilding is taken up.

"Some time ago the electric railway properties in the central west got together and formed the nucleus for an organization to carry their own insurance. This company has not as yet written any insurance, but is getting ready to do so. One property by making an expenditure of a few thou-

sand dollars for betterments, has recently arranged for a reduction in its rates from $1.60 per hundred to 30 cents per hundred. In order to get this rate the insurance carried was increased from $800,000 to $1,500,000.

"Your committee have secured this data in a confidential manner and are therefore not at liberty to give out comparative figures naming any two companies. They recommend that this subject be thrown open on the floor of this

Insurance Statistics on Telephone Properties of the United States

Nov ....1908. ..... Name of Company ..... Capital stock { Securities Outstanding: Pfd..... Com.....

Location of City..... State..... Bonds $.....

No. Telephones..... No. Exchanges.....

	Insurance	Rate per 100	Const. x	OTHER CHES OF BLDG.
Estimated Value of Buildings Central $.....	$.....	c.....		
Branches				

In case you do not own buildings please give Insurance Rate Values and Insurance carried as it will give us a basis for other figures.

	Insurance	Rate per 100	Describe o	Year installed.
Estimated Value of Switchboards $.....	$.....	c.....		
Branches				

Do you carry insurance on telephones, poles, cables, private branch exchanges and other construction installed? ..... If so, what has been your experience?.....

Do you recommend it?..... Insurance carried..... Rate per $100.....

Do you carry fidelity insurance?..... If so, in what company? ..... Rate..... How general do you cover your employes?..... Do you carry employers liability insurance?..... If so, what classes of employes are covered?.....

Amount..... Rate..... Do you carry insurance against damage to general public?.....

If so, what amount ..... Rate ..... Do you carry rental income or use and occupancy insurance?..... If so, what amount..... Rate.....
(Please enclose copy of form used on each class of policies)

How much have you received during past five years from insurance companies?$..... What loss have you had that was not covered?.....* How much have you paid out during that time for premiums?$.....
(Please state in each case of loss how fire started and where.)
In case of no loss state "none"

Did you have any trouble making settlement?..... If so, please state particulars and results.....

What companies were most annoying?.....

What companies most liberal?.....
(If you have not been in operation for five years give figures covering time you have been in operation, naming length of time covered.)

What special means, if any, have you for immediate protection in case of fire other than the city fire departments?.....

Would you be interested if a saving in rate or better form of insurance can be secured in joining with other telephone companies for a substantial portion of your insurance?..... General information
(State whether insurance is carried flat rate on with co-insurance. If the latter, at what percentage? Is the insurance specific or blanket?)

x Describe building briefly as.....story brick,.....story slow burning,.....story fire-proof .....story frame,.....story concrete.

o Multiple, automatic, magneto.

* State particulars about these items if any as to amount. Were you carrying the insurance yourselves or was the payment refused by insurance companies? We all want to be as fully insured as possible, this data, properly given will help establish a basis for agreement on what should be done.

The above report compiled and furnished by

.....Officer.

Blank Sent to Operating Companies to Bring in Insurance Data, for the Use of a Committee of the International Association.

convention at this time for full and complete discussion. It seems to be the consensus of opinion, as the reports would indicate, that you desire an insurance company of your own (We might say here that each blank asked the question 'Would you be interested if a saving in rate or better form of insurance can be secured in joining with other telephone companies for a substantial portion of your insurance?' One company said they would not be, 27 answered that they would, and the balance did not answer the question.) One object in bringing this question before the convention at this time is to get you all interested in the subject so that in the future when data is asked for, we will have your most hearty co-operation. We can only judge the future by the past. The data from the 48 companies indicate that we are paying too much for our insurance. Will these same results be borne out if we secure reports from 500 instead of 48 companies? We have received a number of reports that were not in shape to be used. Some were prepared and letters written to accompany them stating that they did not have time to figure out the totals, but that we could make our own calculations. Reports received that were not clear have not been used."

Respectfully submitted,
Jas. B. Hoge, Chas. West and A. C. Davis,
Committee.

After this report had been read it was voted on the floor of the convention that the committee "be continued for the purpose of investigating the rates charged by insurance companies with a view to determining a just and equitable rate, also with power to act in organizing a mutual insurance company to do an exclusive telephone insurance business, also to do all other things necessary to carry this resolution into effect, and we hereby pledge to such insurance company, when organized, our hearty support."

In accordance with this report the committee sent out from Mr. Hoge's office at Cleveland, additional blanks, requesting information. One of these blanks is herewith reproduced, while the other called for an expresssion of the company's willingness to participate in a plan to organize a special company to carry on a telephone insurance business. Data thus obtained will give a basis for additional consideration of the subject.

It has been desired that Independent telephone companies all over the country shall participate in the discussion and benefit from the carrying out of this plan, and the co-operation of all such companies is invited. The reports at the Kansas City conference uniformly indicate that telephone companies have been paying too much for their insurance, and have been submitting to many unnecessary restrictions. The co-operation of a sufficient number of companies will undoubtedly insure the completion of arrangements for doing away with such unsatisfactory conditions.

Government Ownership Discussion in New Brunswick.

The following leading editorial from the St. John, N. B., *Globe* of March 13 indicates the conflicting sentiments on government ownership of telephones prevailing in that province:

"The members of the Union of New Brunswick Municipalities, in session at Moncton this week, discussed at some length the question of the taking over of the telephone lines by the provincial government. There was complaint from various quarters that the rates were too high, and that the advance recently made was exorbitant, and the view was set up that government ownership was the only remedy for the evils from which the country suffers. The speeches, as reported in the Moncton papers, were woefully deficient in facts, although strong in denunciation of existing conditions. Very few of the speakers evidently had considered the subject as fully as they should have done in discussing so important a proposal. Had they done so they might possibly have been able to give good reasons for the faith they possessed, and have proved even to doubters that it was the duty of the government to own and manage telephones.

"It is significant, however, that the only speaker who dealt with the subject in a carefully-prepared paper, Dr. A. W. MacRae, reached the conclusion that under government ownership there would be no reduction of rates, but that the lines would be extended to points not now reached. The delegates almost unanimously voted in favor of government ownership, but it will be necessary to give more convincing reasons than have been given in favor of taking this step. Manitoba's example is being pointed to, but the view that the new conditions in that province are satisfactory is far from being generally accepted. The first year's operations do not leave the balance of profit claimed, nor are the reductions of tolls satisfactory."

The Development Study*

By S. D. Levings

When every block and specially bounded area in a town has been inspected, in accordance with the preceding chapters, and all the required information has been obtained, the field work portion of the study may be considered completed, and the next step in order, the final work in the office, taken up.

FINAL WORK IN THE OFFICE.

The final work in the office consists of determining the final classification of the town, reducing the present and estimated ultimate possibilities as obtained by the "house count" to line figures, and in placing such figures on the record map provided for this purpose in the preliminary office work. It further consists in placing on this map the figures upon which the design of the various parts of the entire plant are to be based, and in making the final distribution of the ultimate lines. The ultimate number of lines is determined from a comparison of those obtained in the field with the estimated lines obtained from the population curve and development ratio. In conjunction with this work, the extent of each of the various territories within the city, at the end of the 20 year period, is calculated and shown on the final record map, together with the estimated additional territory that will be annexed to the town, and covered by the plant in the ultimate time.

In order to determine the final classification of the town, the present and ultimate possibilities as obtained from the field work and noted on the record map in pencil, will have to be totaled. When first classifying the town from the telephone standpoint, it was classified in accordance with the results of a preliminary inspection, and the assumptions upon which the development study work was based were made on this preliminary classification. As the actual development figures are now in hand, it is possible to check this preliminary classification, and, if found erroneous, to correct it, thus obtaining the true classification upon which all future work can be based. Reference to the classification previously described shows that the ratio of telephones, or stations (not lines) to the population is the basis upon which the classification was determined. The present inhabitants, as determined by the population curve, together with the present possibilities as determined by the study, being known, the development ratio can be ascertained by following the rule for classification previously given, which will determine the correct final, initial classification. Having the ultimate development ratio as shown by the ratio curve for the particular classification in which the town is placed, the ultimate possibilities can be ascertained by applying this ratio to the population at the 20 year period, as indicated on the population curve. Assuming that the town in question has been determined to be in class "A," from the initial development ratio just obtained, this development ratio must be not less than 10 per cent for the initial, and as shown by the ratio curve, not less than 15 per cent for the ultimate development. Having thus determined the ultimate development ratio, it is applied to the 20 year population figures as indicated by the population curve, and the resultant figure represents the possibilities that may be expected at that time. From the number of ultimate possibilities, or stations, the ultimate number of lines can be determined by applying the line ratio which will be defined presently. It will always be found that the ultimate lines obtained in this manner, will be considerably in excess of those obtained from the "house count," if the town is normal, and the work properly done. This is true for the reason that the figures obtained from the population curve cover the development of a greater area than is occupied by the present inhabitants, due to the growth of the town during the life of the study. On the other hand, the "house count" was made on the present area occupied by the inhabitants. In order to compensate for this increased area, due to the growth of the town in area and population during the life of the study, a redistribution of the ultimate lines must be made so as to cover the ultimate territory, and the figures obtained from the population curve for the ultimate requirements are used in conjunction with those obtained from the "house count" as previously stated.

The first step to be taken, in calculating the ultimate area is the reduction of the possibilities, both present and ultimate, to lines. The difference between a telephone possibility, and a line, should be thoroughly understood, as many errors have been made by confusing the two terms. They bear a direct relation to each other, but they are not synonymous. A telephone possibility is commonly called a station, and a station does not imply, with reference to the wire plant, that a pair of wires extending from the central office to the telephone will be required for its sole and individual operation. In the assumptions previously made for the various classes of service that are most common in present telephone practice, it is observed that three classes were assumed, the individual, two and four-party line services. By the term individual line is meant a wire pair that will be required to furnish service to a single station, or possibility. A two-party line is considered as a wire pair designed to furnish service for two stations, such stations being of a class that will require two-party line service. In the same way, a four-party line is a wire pair designed to furnish service to four stations requiring four-party line service. From this it will be seen that the terms possibility and station may be considered as synonymous, but that neither is synonymous with the term line. A line may be considered as a wire pair required to furnish service to a station or stations, according to the class of such stations. As the development figures obtained from the "house count" are expressed in terms of possibilities, and these possibilities or stations are divided into various classes according to their service requirements. Their relative line values then are proportional to their class.

To be continued.

*Continued from the issue of April 10, 1909.

Independent Movement in Jacksonville, Fla.

At a recent meeting of the city council of Jacksonville, Fla., the committee appointed to investigate telephone service with a view to securing relief from an increase of rates by the Bell company, presented communications from the Citizens' Telephone Company, Grand Rapids; Central Telephone and Electric Company, St. Louis; Automatic Telephone Company, Fall River, Mass., and Automatic Electric Company, of Chicago.

The committee had communicated with each, and secured costs of installation, etc., for a new system, of the size required for the city.

It is thought that a competing company will be willing to accept a franchise, conditional on payment of 3 per cent of its gross receipts to the city, in addition to taxes upon proper valuation; and to agree not to charge in excess of $30 a year for business and $18 for residence service.

The residence business could be built up to large proportions, and in view of the fact that Jacksonville is probably the fastest growing city in the south, the outlook for an Independent concern which will give a square deal is of the brightest.

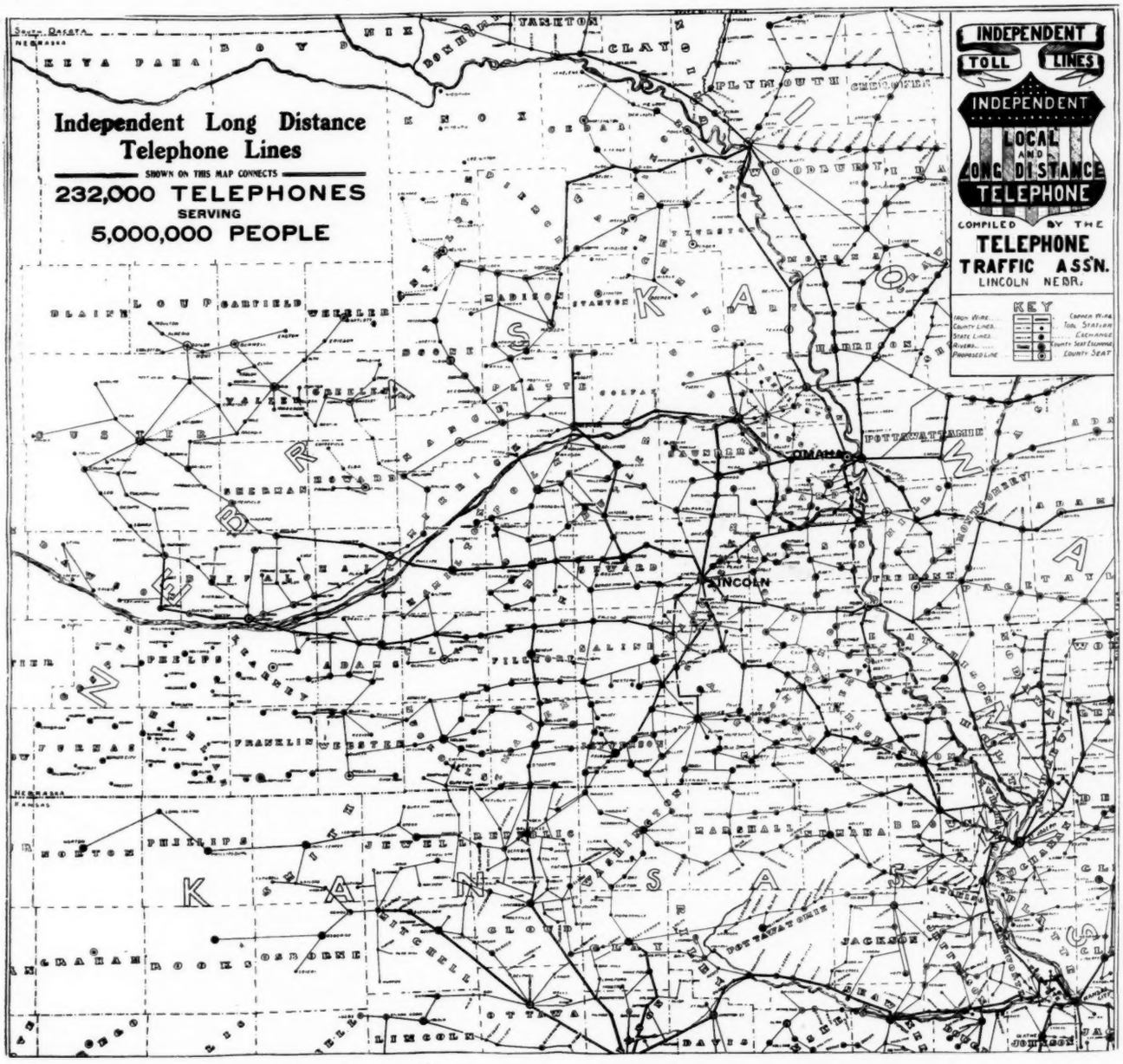
In addition to the city business of Jacksonville, several enormous colonization plans have been floated which have landed large numbers of farmers and settlers in virgin territory—all these will need telephones. There are also several good connections with Independent companies in interior towns of Florida, all ready for an Independent in the state's metropolis, Jacksonville.

Since the Bell company's action in making an agreement with the East Florida Telephone Company, of Gainesville, precludes any possibility of competition in that direction, business methods in Jacksonville have become very arbitrary. The company raised the rates on the Jacksonville municipal service, and for business and residence telephones. Sentiment is gradually beginning to favor action looking to the establishment of a competing service, and the committee intends to work untiringly until relief is secured, either by proper legislative action or by a competing service.

Our Florida correspondent will keep our readers fully informed as to the progress of this interesting situation.

New Map of Nebraska Independent Toll Connections.

Much credit is due to the Nebraska Independent Telephone Traffic Association for its compilation of the new map which is reproduced in this issue of TELEPHONY. It not only gives the toll connections for the State of Nebraska, but



The Latest Map of Independent Long Distance Lines in Nebraska and Adjoining States.

for the lines in adjacent states over which there is frequent occasion to route business. It is understood that in the near future a new directory is to be issued, which will be a valuable adjunct to routing instructions which are now used by members of the Association.

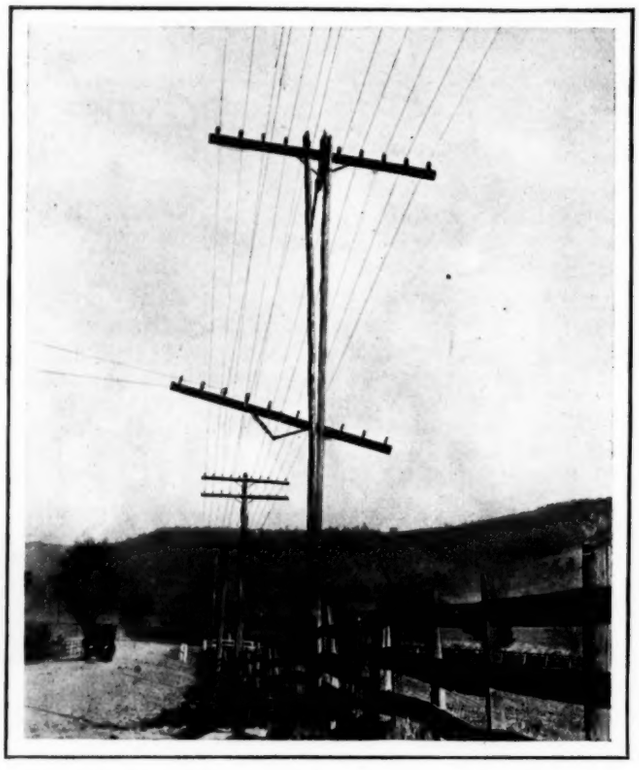
The Independent toll business in Nebraska has been increasing very rapidly, and the present map fills a great need. The work of preparing such a map is very difficult, and Secretary Mattison and his associates have performed a very valuable service to companies doing a toll business with cities located on the lines in Nebraska, Iowa, Kansas, and Missouri which have been placed on this map.

LETTERS ON PRACTICAL SUBJECTS

Pole Split by Lightning.

I enclose a photograph showing novel pranks played by lightning during an electrical storm late last summer.

This forty foot chestnut pole, perfectly sound before the



Telegraph Pole Split Through Center by Lightning. Lower Cross-Arm Fell Off, but was Held by Wires.

shock, was torn apart from top to base, being divided exactly through the center and as smoothly as would have been possible had a workman done it with an axe and wedges. Several other poles on either side were more or less splintered, where the discharge leaked down.

The lead carries 5 toll lines belonging to the Inter-Ocean Telephone and Telegraph Company of Buffalo, and two rural magneto lines belonging to the Corning Telephone Company.

A number, but not all, of the toll drops were burned out. While we lost the switchboard drop, and 12 out of 18 ringers on one rural line, on the other local line, which serves 16 subscribers, only the two most distant instruments were injured.

At the time the photograph was taken, the lower arm hung by the line wire, where it was let fall when the pole divided, and freed the through bolt and heel lag.

Corning, N. Y. F. A. Klock, Mgr.,
Corning Telephone Company.

Personality in the Telephone Business.

In nearly every trade journal I pick up, great stress is being placed on the element of personality in business.

It appears to me that this subject has not been given proper consideration by the Independent telephone men. Perhaps it is because nearly every telephone plant is owned and operated by a corporation, and it has been stated that corporations have no souls, and consequently no personality.

From the fact that nearly all of the best people in each community are users of the telephone, the element of personality has a chance to play a most important part in the conduct of the business.

Every business firm does have a personality, the same as every individual. Some are more marked than others. Just as an individual is reputed to be narrow, selfish and indifferent to the interests of others; or on the other hand to possess the opposite characteristics, so is the corporation. The personality of the latter is given to it by its employees, and not by its stockholders and board of directors, unless they see to it that the employees are persons with a personality fitted to their occupation.

It is not enough for an Independent company to proclaim that it is owned by people living in the county. That is all well enough as far as it goes, but it will not go very far if the employees, from the manager down to the messenger, act as mere machines, put there to grind out as much money as possible for the stockholders, and showing as little courtesy, and doing as little work as possible without losing their positions. When such conditions exist, it matters little to the subscribers whether the stock is owned in the county or in South Africa.

The great trouble is that the personality of the employee was the last thing taken into consideration when he was employed.

The manager of one of the largest telephone companies in this part of the country, one which conducts a large number of exchanges, said to me not long ago, "We make it a rule to place technical men in charge of our exchanges."

This policy may be all right as far as the operating department is concerned, but when it is applied to the man who is to direct and shape the affairs of the company, especially in its relation to the public, it will require something more than technicality.

As a rule technical men are narrow, especially when they first finish their courses. They are not to be blamed for this, because their education has been all along one line. As a rule you will find that the operating department is all that could be desired. The wire-chief can locate trouble to the fraction of an inch. A line or an instrument does not stay out of order, but all trouble-tickets of this character are promptly cleared.

There is another class of trouble that is not cleared however. That is the trouble of the disgruntled subscriber. One of them has a grievance against an operator, who has cut him off in the midst of a conversation, or talked short to him; another has a dispute about an account with a collector, who knew nothing about the account, and cared less. All he knew was that he was expected to get the money or order out the telephone. Another claimed he was being discriminated against in rates. Another claimed the company had no right to raise its rates, it was getting rich as they were. These troubles not being cleared up as they appear, rankle in the breasts of the subscribers, and serve to retard the progress of the business.

It is all right for a manager to be a technical man, but he should be something more; he should possess a large knowledge of human nature; he should be a good "mixer"; in other words should possess a personality, and it should be of that sort that will impress the people with the idea that his company wishes the good will of its subscribers as well as their money. If they do not obtain the former, they will not long be able to collect the latter.

I do not mean by this that he should create the impression that the good will is desired if, in order to get it, the company is to be deprived of a just revenue. Many Independent companies have made a mistake in this regard. They have started out by promising everything the subscribers asked, and not being able to keep this up, they have lost their good will. It is always best to promise too little than too much, but always live up to your promises.

The Independent telephone companies have a splendid chance to show up this personal element, as compared with the "public-be-damned" policy of some of the Bell

people. By following out this idea our company has been able to raise its business rates fifty cents per month, during the hard times, and only lost one subscriber in doing so.

Princeton, Ind. E. H. Jenne.

WANTED—TROUBLE ARTICLES.

Some of the letters about unusual troubles are fine. The editors enjoy reading them, and the managers do, and the wire chiefs start figuring, and the troublemen begin—"Well, that's nothing. Why, when I was out on that line that runs by the old" and so it goes with the unusual troubles.

A NEW THOUGHT.

Let's have a few letters about COMMON troubles. We want you to let us see what is the best way to handle your exchange's business methods, the apparatus you buy. Pick out the trouble that shows up oftenest, tell how it shows, how you can locate it the most quickly and surely, how to repair it, how much it costs in fact, the whole history.

Pick out any kind of trouble, only let it be your worst one. Never mind whether it's collections, getting your neighbor to settle tolls, driving the motorcycle, or making bells ring—send it in, and be sure and tell how you cure it. If you have any trouble you can't clear, tell us about that—we'll try to show you what's the matter.

Write that letter soon—make it practical, and helpful, and we'll print it, sure—send you a little check, maybe, too.

Address, The Editors of TELEPHONY.

Telephone as a Burglar Alarm.

F. A. Cocke, a horse dealer of San Antonio, was attacked a few nights ago in his office by a robber. The two engaged in a hand-to-hand conflict and Mr. Cocke succeeded in flooring the robber. While sitting on him, with one hand on his throat, Cocke reached the telephone with the other hand and brought the police.

Mr. Cocke now believes in having desk telephones, and enough of them, so that one will always be handy in case of emergency.

Co-Operation.

Foreman Sweet of the Plant Department, Lowell District, while rebuilding lines, entered a yard for the purpose of requesting permission to make repairs. He was routed by the family bull dog. "That dog shows a lack of co-operation," he remarked to Ralph Hardy. "I don't see it," replied Ralph. "He met you half way and I don't see why you shouldn't go the other half.—New England Telephone Topics.

The Telephone in the Courts

Conducted by A. H. McMillan

A Franchise Is a Quasi-Contract.

The Louisville Home Telephone Company brought suit against the city of Louisville and the Board of Public Works of the city for a writ of mandamus to compel the board to advertise and sell at public auction a certain telephone franchise in the city. The defendant filed demurrers to the application. One of the grounds of demurrer was that the telephone company was not authorized to bring the action. For this and other reasons, the Circuit Court for Jefferson County denied the writ, but the Court of Appeals of Kentucky reversed the decision, holding that the relators were authorized to bring the suit. One John Coleman was joined as relator with the telephone company, he being a citizen and resident engaged in business in the city, and the court held him entitled to act when the city attorney or other representative of the commonwealth failed to act. Other objections were directed against the validity of the ordinance requiring the Board of Public Works to sell and advertise the telephone franchise, but the ordinance was held to be within the power of the city.

The ordinance providing for the sale not only excluded the Cumberland Telephone Company from being a bidder, but also provided that if the Home Telephone Company was the purchaser, its former franchise should be at an end.

Counsel for the defendants contended that as the telephone company was operating in the city under an already existing legal franchise, the proposed franchise, if it became a purchaser, would release it from its liability under a previously existing franchise, and that this result was contrary to Section 52 of the Constitution, which reads:

"The general assembly shall have no power to release, extinguish or authorize the releasing or extinguishing, in whole or in part, the indebtedness or liability of any corporation or individual to the commonwealth, or to any county or municipality thereof."

The court held that the ordinance was not invalid for the reason above stated, because the relation between the city and the owner of the existing telephone franchise was quasi-contractual and for the performance of a public service. Louisville Home Telephone Company vs. City of Louisville, 113 S. W., 855.

Contracts Made by Telephone Should be Reduced to Writing.

In a recent case heard by Judge Rentoul at the City of London (England) Court, there was a discussion of the validity of contracts made by telephone and not subsequently reduced to writing. A Glasgow firm made a contract to buy five hundred tons of goods from a London company in installments of fifty tons a month at thirteen pounds a month. When the deliveries were completed, the defendants had delivered five tons too much, and as the market price had fallen the plaintiffs demanded the return of the amount overpaid. The London firm alleged that they agreed over the telephone with the Glasgow company's London house to make the allowance only if future business resulted, but it did not. The Glasgow people said this was the first they had ever heard of such an agreement and denied that they were bound by it. The court said he would hesitate a long time before he held a man bound by the words that came over his telephone. Every contract that was made in such a way ought to be confirmed by writing, he held, if it was subject to any doubt, before it was upheld by a court of law. If it were merely proven that a message had proceeded from a man's telephone in his office without any proof of who sent it, he did not think the firm was bound. This is not the rule in the United States.

Independents Defeated by Technicality in New York.

A case which the Independent telephone interests of New York hoped might be solved upon its merits has been decided upon purely technical grounds. The matter was that of the New York Independent Telephone Company asking for mandamus to command the Commissioner of Water Supply, Gas and Electricity to issue to it a permit to run a ¾-inch cable, containing thirty conductors, in the trunk

duct of the Empire City Subway Company, Ltd., leased to the Mercantile Electric Company on Wall Street, between William and Hanover streets, pursuant to a request made of the commissioner July 3, 1907.

The ground for the decision was that the telephone company had never made application to the subway company for space in the subway, pursuant to the rules and regulations adopted by the Department of Water Supply, Gas and Electricity of the city, which required that all applications for space in any subway must be made in writing to the subway company owning the same. The court expressed its regret at having to make the decision upon such a ground, saying: "It is disappointing that the large array of facts exhibited in the moving and opposing papers, the briefs elaborated with learning and ingenuity, asking findings of complicated property rights and valuable franchises and inviting examination of interesting questions of law, must, after all, be dismissed from examination upon a rule commonly called technical, because a rule of practice, which may not be foregone in the court of first as it might be in that of last instance."

The Independent telephone company, through its attorneys, Page, Crawford & Tuska, proposes to carry the matter to the Appellate Division of the Supreme Court.

Matter of N. Y. Independent Tel. Co., N. Y. Sup.

Cincinnati Wire Tax Illegal.

A council has no right or authority to demand the payment by telephone, telegraph and electric companies of a tax on the wires strung in the streets of Cincinnati, according to an opinion rendered the Board of Public Service by Assistant City Solicitor Greenwald.

The Board had asked the city solicitor's office for an opinion on the validity of an ordinance passed in 1894, assessing a "wire tax" on all companies operating under that ordinance at a certain rate per mile of wire. The city electrician complained that the companies had not paid the tax.

The ordinance is plainly invalid, Mr. Greenwald declares. He says: "I find that there is no authority granted by the statutes of the city, giving the power to charge a license even for the use of the streets for these purposes, and therefore I beg to advise your honorable board that, in my opinion, this section of the ordinance which provides for such a wire is invalid, and the collection of such fees cannot be enforced." Mr. Greenwald quotes a circuit court decision, which says: "The city's power is exhausted when it allows the company to occupy the streets and fixes the mode of using them, and it is their duty to agree as to the use of the streets for such purposes without compensation or subsidy."

Does Failure to Give Good Service Justify Refusal to Pay Rental?

Alleging that the Southwestern Telegraph and Telephone Company has failed to comply with its contract to furnish him with proper telephone service, W. J. Howard, an attorney of Houston, Texas, has obtained a temporary injunction in the eleventh district court against the company, restraining it from discontinuing his service or removing the telephone instrument from his office for failure to pay bills for two months which are alleged to be for more than the amount provided in the contract.

The temporary injunction was granted upon the plaintiff furnishing bond in the sum of $100.

The plaintiff in his petition complains of the time that it takes him to get in connection with the central operator, of the trouble caused by being connected with the wrong number and of being cut off in the middle of conversations.

By the contract the plaintiff contends that the telephone company agreed to furnish him with proper telephone service at the rate of $5 per month, which rate, he alleges, was adhered to until the months of January and February of this year.

Oregon Gross Receipts Tax Valid.

In the opinion written by Justice Bean, the Supreme Court of Oregon affirmed the decree of the circuit court in the case of the state against the Pacific Telephone & Telegraph Company, in which the constitutionality of the initiative and referendum amendment adopted by the legislature in 1903, and by the people in 1906, is upheld.

The company is required to pay the annual license fee of 2 per cent upon the gross receipts, and to make annual statements to the state treasurer. The case probably will be appealed to the Supreme Court of the United States. See Pacific Reporter.

Practical Questions and Answers

Phantom Circuit on Iron and Copper.

We have a No. 12 copper toll line between two of our stations, the distance being 15 miles. We are greatly in need of another circuit and do not feel able to use copper. Could we string an iron circuit and then make a phantom circuit from the copper and iron? It so, what size iron wire should we use?

Under no condition is it advisable to put a phantom circuit on iron and copper circuits together. The phantom itself must be transposed to keep it quiet, and this is out of the question where two different metals are used. Even if transposed according to a special scheme, the phantom would tend to be noisy on account of the different behavior of iron and copper when carrying alternating current.

Electric Light Noise on Common Return System.

Is there any method of removing the humming noise caused by an alternating current on a telephone lines, where the McCluer system or the common ground return wire is used, without changing over to a metallic system throughout? The town is partly cabled. We have three or four lines in particular that are in very bad condition, making it almost impossible to talk over them. These lines last referred to run beside an electric light circuit carrying 1,000 volts, 125 cycle, for over a mile, being over 25 feet apart. These same lines take the cable for about one-half mile to the central office, this being metallic for that distance. Can we arrange it so as to offset this humming noise, without making an entire metallic circuit of these lines, which would mean a large expense?

To get entirely rid of the electric light noise in your case will require carefully transposed metallic circuits for the lines which parallel the lighting lines. Some relief may

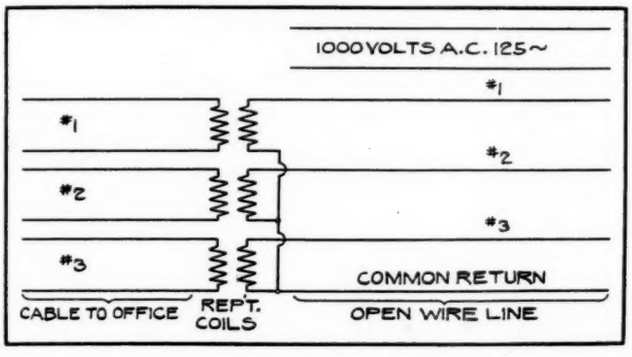


Fig. 1.

be obtained, in case the system is entirely common return, by carefully insulating the return wire at all points. In addition, the return wire should be carried on the poles near the center of the subscribers lines of which it is the return.

Another scheme may offer you partial relief. See Fig. 1. Install ring-through repeating coils at the end of the cable, and run an insulated common return for the exposed lines the rest of the way. This common return may be of bare wire, but must be carried on glass insulators the same as the lines.

Even if you make the exposed lines entirely metallic, it will be advisable to run each line through a ring-through repeating coil just before entering the switchboard. This is to keep them from becoming grounded when connected through the switchboard to ground or common return lines.

Smallest Condenser.

How small a condenser can you talk through? I have noticed that a 2-M. F. condenser does not seem to make any difference and have even tried a ½-M. F. with apparently no loss of loudness. Not having a condenser of less size I would like to know if the limit has been found.

The exact limit of speech through a small condenser naturally varies considerably, depending on the ear of the listener, the quality of the apparatus, battery supply, and the loudness and clearness of the voice of the speaker. Tests have been made in the telephone laboratory of Purdue University in which a small condenser, made of sheets of tinfoil separated by ordinary writing paper, is reduced in size until the limit of speech is reached. By the limit is taken

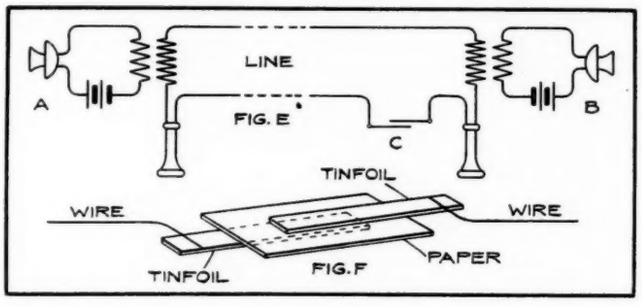


Fig. 2.

to mean the least which will still be comprehensible to the listener.

In making the tests the circuit of Fig. 2-*E* was used. At *A* was wired up a complete local battery talking set, using 2 cells of storage battery to supply the transmitter. Dry cells are not steady enough for reliable tests. At a distant point, in a telephone booth, out of hearing of *A*, the talking set *B* was wired. Dry cells were used here, as the loudness of talk from *B* to *A* is not important. *C* is the small paper condenser which the tester, *B*, may regulate. Two strips of condenser tinfoil were cut, about two or three inches wide and six inches long. On a smooth surface was laid one of these strips, covered by the paper, with the other strip on top. The arrangement is shown in Fig. 1-*F*. The whole was pressed together by a suitable weight, as a book or tablet.

This small condenser will have its greatest capacity when the two tinfoil strips are entirely opposite each other. By pulling the upper one to the right, as shown in the illustration, the capacity may be made smaller to any desired degree. Starting with the greatest capacity, *A* speaks to *B*. The latter then reduces the condenser and they try conversation again. In this way they carry the reduction as far as possible, always taking as their guide the loudness and clearness with which *B* can hear *A*, since *A* is on the storage battery.

The smallest sample which was obtained was ⅜ in. by ½ in., having $\frac{3}{16}$ sq. in. surface on each piece of foil. The ordinary result was about ¾ in. by 1¾ in., having 1.31 sq. in. Its capacity would probably be about .000038 M. F. This is only approximate, since the exact distance between the inner surfaces of the tin foil was not constant, the sheets being held together by the mere pressure of a weight.

TO WIRE CHIEFS AND MAINTENANCE MEN.

Clearing of troubles which occur in your exchange, inside or outside, may be made the subject of short, practical letters which will interest other telephone men These TELEPHONY *will gladly publish, if illustrated by diagrams or photographs. Simply write a description of the nature of the trouble, tests and location, cause found, and method of repair. Payment will be made for all letters published.*

Telephone News

INDEPENDENT TELEPHONE CONVENTIONS

Indiana, Indianapolis, May 12, 13; Missouri, Kansas City, May 19, 20; West Virginia, Parkersburg, May 27, 28; Mississippi, Jackson, June 11, 12.

Louisville Citizens' Committee Endorses Independent Service.

A committee of leading citizens of Louisville, Kentucky, has recommended that the alleged unsatisfactory rates and service of the Cumberland Telephone and Telegraph Company (Bell) make it desirable for citizens to throw out its telephones, and use the Home company's service. An increase in rates for the Home company, to enable it to operate an enlarged plant at a fair profit, is also recommended.

The report says:

"The committee has not found any reason to suppose the Cumberland Telephone and Telegraph Company will agree to a reduction of its present rates, unless compelled by the courts to do so at the end of long litigation. It is responsive neither to public sentiment nor to municipal authority.

"The only relief open to those who regard the charge excessive—and the investigations made by this committee in other cities lead it to believe that these rates are excessive—would be to take out the Cumberland telephones if they care to do so, but since telephone service is a necessity, they would need in that case to call on the Louisville Home Telephone Company for service.

"On its present schedule of rates the Louisville Home Telephone Company cannot command the capital necessary to enlarge its service sufficiently to take care of such additional business. This is the claim made by the Louisville Home Telephone Company, and the careful investigation made by the committee convinces it that the claim is well founded.

"We, therefore, consider it vital to the protection of the

public's interests in this matter that the Louisville Home Telephone Company should be given fair consideration in the matter of rates. It will be years before any relief in the rates charged by the Cumberland Telephone and Telegraph Company may be expected."

Lincoln Telephone & Telegraph Company to Make Important Extensions This Year.

Conditions in Nebraska are so favorable to the Independent telephone business that well posted authorities state that there will be more new construction in 1909 than in any previous year.

The Lincoln Telephone & Telegraph Company, which operates a very successful system in Lincoln, and also long distance lines, will be very active in meeting the demands for extensions which result from its satisfactory service. General Manager L. E. Hurtz reports that ground adjacent to the present exchange building has already been purchased and the company will erect upon it an addition to its present office building at once. A branch exchange is to be built this spring at South Lincoln, where a site has been purchased. Large orders have been placed for conduit, cable, and for other construction material to be used in the city, while several carloads of copper wire will soon be on hand for use in extending toll lines in various directions in this locality.

The toll business of the Lincoln Telephone & Telegraph Company has been growing rapidly, and the connection of its lines to many local exchanges has greatly strengthened their position.

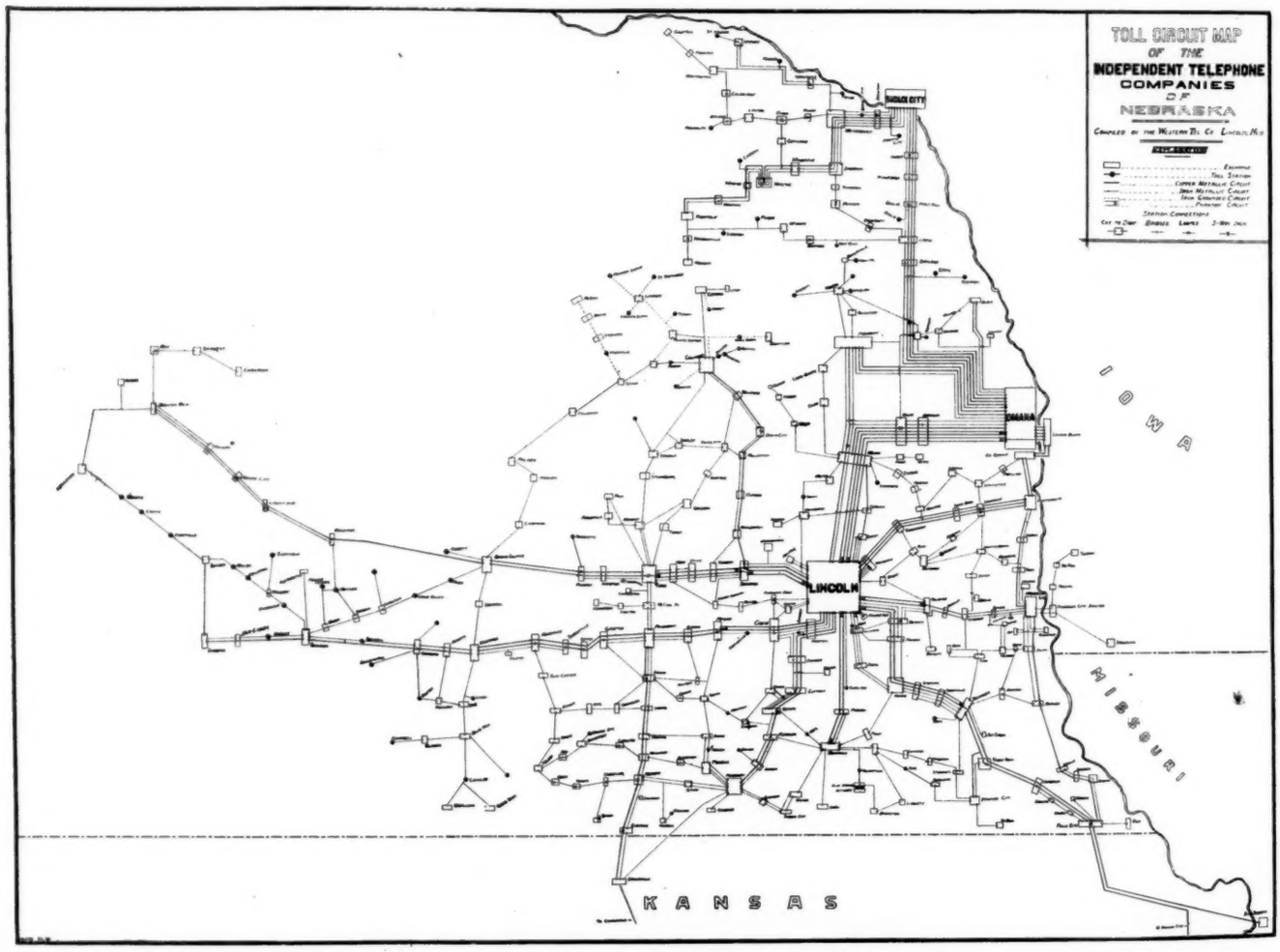
The accompanying circuit map, which was prepared by Mr. George K. Gann, traffic manager of the Lincoln Telephone & Telegraph Company, was first shown at the convention of the Nebraska Independent Telephone Association. It indicates the present status of toll lines radiating from Lincoln and Omaha, which already provide for a comprehensive service, although the extensions for the coming season will make valuable additions to the facilities.

The New Minnesota Independent Telephone Association.

Some of the successful operators of the smaller Independent telephone companies in Minnesota have recently organized an association which promises to bring good results. This is the Minnesota Independent Telephone Association, the organization of which was finally perfected at a meeting held at the Ryan Hotel in St. Paul on March 25th. At this meeting the following officers were elected: president, L. S. Clark, Bellingham; first vice-president, Geo. Ocobock, Norwood; second vice-president, D. M. Neill, Red Wing; secretary, W. S. Clay, Hutchinson; treasurer, C. H. Edwards, Mankato.

There are many ways in which membership in any of the properly conducted telephone associations can benfit the company of moderate size, and the officers of the Minnesota Independent Telephone Association urge managers of locally owned Independent telephone exchanges in Minnesota to communicate with them at once, with a view to strengthening the new organization and their own positions by becoming members.

The annual dues of the association are 1 cent for each



New "Circuit Map" of the Nebraska Independent Long Distance Lines.

telephone operated by the member, and the initiation fee is $5.00. Correspondence may be addressed to secretary W. S. Clay.

The West Virginia Convention, Parkersburg, May 20 and 21.

The Independent telephone convention of West Virginia has the reputation of being the most successful, considering the size of the state, of any held in the country. The different companies are all prosperous and managed by progressive men. There is a good organization of active and loyal members in the Association and when these men come together in the annual convention it is surely to be lively and helpful.

This year the convention is to be held at Parkersburg, in the Chancellor Hotel, and the indications point to an exceptionally large and successful meeting. R. M. Dalzell, assistant secretary of the Association, has been hard at work on plans for the convention and in the next few weeks the other officers will hold a meeting to make final preparations. Mr. Dalzell reports that quite a number of manufacturers and supply dealers have already made reservations for exhibit, and others should report their intention to visit the convention promptly, in order to make good reservations.

While in Chicago recently, Mr. A. C. Davis, secretary of this association, as well as of the International Association, mentioned some of the plans for the convention to a representative of TELEPHONY and we are convinced that West Virginia will have one of the best conventions of the year. Telephone men in the State of West Virginia and among the neighboring Independent companies in other states are advised to take advantage of the opportunity to see a first class gathering of live Independents.

QUESTIONS FOR THE FIELD

Telephone men are invited to send to the Editors, for publication in this column, requests for information on all subjects of practical value in exchange operation. If possible, so word questions as to bring out definite information on each feature of the proposition.

All readers are invited to forward to the Editors, for publication in this section, as complete accounts as possible of their own experiences bearing upon the questions asked.

Names will be withheld if requested.

Farmers' Line Management.

I am gathering data relative to the farmers' line situation and the method of handling the farmers' line problem by other companies.

I would like to obtain a copy of your farm line contract (or copies of your different farm line contracts, if you have more than one proposition) and, if you have no printed contract, a brief outline of your proposition to the farmer.

The sketch below is given as an illustration of about what is wanted in the way of information regarding rural lines:

"Jones Telephone Company, Jonesville, Ill.: We are operating about 350 rural telephones on lines belonging to the company, our rate for this service being $1.50 per month, and giving the farmer service to the exchange with which he is connected, and also to one other exchange to which we have free service connections.

"We are operating about fifty telephones on rural lines owned by the farmers themselves, we merely connecting with them at the city limits and giving them exchange service. Our charges for this service is 35 cents per month..

"Of the two above arrangements, we prefer the latter, as we believe that it brings the company more net profit. In the former instance we of course maintain the entire line and also the instrument, and in the latter everything outside of town belongs to the farmer and is maintained by him.

"We also have one line, owned from town by the farmers, but on which we furnish the telephone instruments and maintain the same providing that the farmer brings the instrument to town when it is out of order. On this line we get 60 cents per month per set. We prefer the second arrangement above to this one.

"We collect monthly, after the end of each month excepting at one exchange, where we collect quarterly. We have some trouble in getting prompt collections from the farmers and would like to have the experiences of other companies along this line, and to know if any company is making prompt collections from farmers.

"We are not building any rural lines ourselves now, if we can get out of it, and none at all unless they will average at least two subscribers to the mile of grounded line. For rural lines we use cypress poles, 20 ft., with, usually, four pin arms. We are pushing the construction of rural lines by the farmers themselves, and are doing all we can to connect with them on the 35c per month proposition.

"We have several small mutual companies with which we connect. To these we give every assistance, helping them to organize, helping them to build their lines, and to get started. They are doing a great deal to develop the rural territory for us, etc., etc."

If you are having any trouble with your farmer subscribers, have any particularly bothersome problem connected with the matter, I would like to have a brief outline of it.

Charleston, Mo. E. C. Blomeyer,
Auditor, Southeast Missouri Telephone Co.

A WORD TO THE WISE.

Nothing is obtainable for nothing. Send in your experiences, and others will do likewise. Then you will receive enough information to make it profitable to be a charter member of the telephone men's Clearing House for Information represented by this column. We are all looking to you, personally, to help make this experiment a success.

The Census Report of Forest Products in 1907.

The United States Census Bureau, in co-operation with the Forest Service, has recently issued circular No. 10, on "Forest Products." It gives the statistics for the production of timber, and its uses for various purposes, in the year 1907. Part of the report deals with poles purchased, which are shown to have been less in 1907 than in 1906 by 66,668. There was, however, an increase of $758,471 in the total cost of all kinds of poles. The average cost per pole showed an increase of 27 cents. The telephone and telegraph companies purchased 2,311,651 poles or 65.9 per cent of the total. This was 84,071 poles less than in 1906. Ten per cent of the total number purchased by the telephone and telegraph companies were treated with preservatives. The steam railway companies seem to be a little more progressive, having used 27.6 per cent treated poles.

Mississippi Association's Convention to Be Held June 11th and 12th at Jackson.

The Mississippi Independent Telephone Association, which has been organized for about a year, is rapidly growing in importance. Frequent meetings are held and members who participate are much benefited from their membership in the Association.

President J. B. Shannon, of New Albany, Miss., writes that the next meeting will be held on June 11th and 12th at Jackson, the capital of the State. Not only will telephone companies of Mississippi be well represented, but there will be many visitors from Independent companies in Western Tennessee and Alabama.

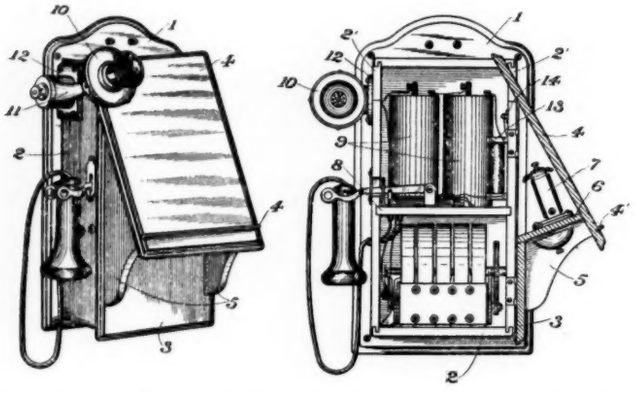
Telephone Patents

Conducted by Max W. Zabel

SUBSTATION TELEPHONE SET.

R. Hansen, Sioux City, Ia., patent 916,552, March 30, 1909, One-half interest assigned to Interstate Supply Co., Sioux City, Ia.

A new arrangement for the magneto wall telephone is here shown, consisting of the box 1, with a cover 5, which is open. The cover has a writing plate 4, underneath which

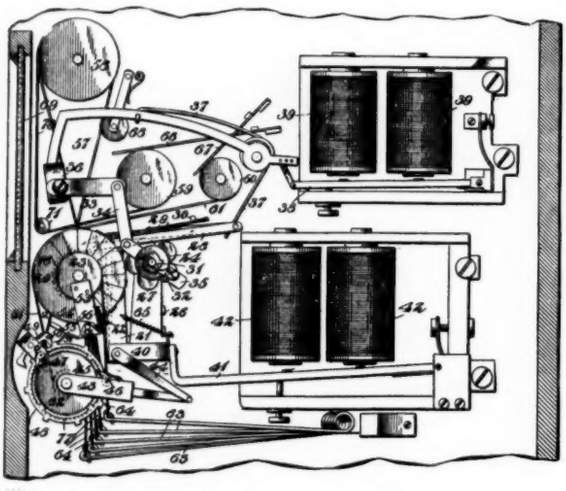


the ringer 7 is mounted. The batteries are mounted on a shelf and the generator is placed beneath it. The induction coil is mounted on the side of the cabinet and the switch-hook on the shelf. The transmitter, mounted upon an arm, is hinged to the side of the telephone cabinet, so that it can be raised or lowered as desired.

TELEPHONE CALL RECORDER.

H. Fascher, San Diego, Cal., patent 915,578, March 16, 1909.

Means are shown in this patent by virtue of which a calling subscriber may indicate at the instrument of a called subscriber, who happens to be absent and unable to answer the telephone, the number of the calling subscriber, so that the called subscriber, when he returns, can have the connection established. The device at the called station consists of a recording instrument having two electromagnets, one of which sets the numbers and the other of which causes the numbers to be printed upon a tape. The signal sending

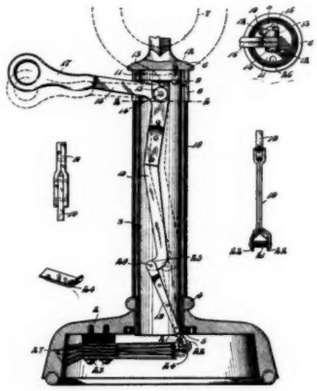


device consists of a push button 1, which actuates a segmental wheel 2, thereby winding up the spring 3 to rotate a wheel 5, which is provided with contact points 6, which contact points depend upon the number which is to be shown on the called subscriber's tape, and depends also upon the contact arms 7, and their realtive position intermediate of contact points 6. Thus, the number of impulses sent and the number appearing, depends upon the number of contact points 6, intervening between the contact points 7. Springs 15 and 16, respectively, engage the contact points 6 and 7, and operate the two relays when the signal is to be recorded.

DESK TELEPHONE

A. H. Weiss, Evanston, Il., patent 916,235, March 23, 1909, Assigned to Kellog Switchboard & Supply Co., Chicago.

The new features of this desk telephone arrangement are



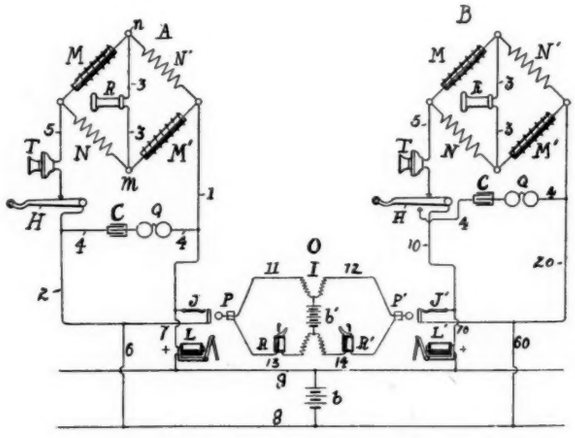
the means employed for actuating the springs 27, which are mounted in the base of the desk set 2.

It is intended to provide link arrangements, so that a strong pressure can be exerted against the springs when it is most needed, and to this end, the switch-hook lever 17 is pivoted to a link 19, which has a roller 22, which actuates the spring 24.

TELEPHONE SYSTEM.

Ray H. Manson, Elyria, O., reissued patent 12,929, March 23, 1909, assigned to Dean Electric Co., Elyria, O.

This patent covers a substation talking circuit, utilizing a Wheatstone bridge arrangement consisting of the non-



inductive resistance N, N', and the inductive M, M', with a receiver R connected between the terminals m, n. Direct current flows equally through the two paths, but the voice currents, of course, take the non-inductive path and thus

actuate the receiver. The circuit is so arranged that equal quantities of current flow through the two paths of the Wheatstone bridge. The signal *Q* is an alternating current signal.

TRANSMITTER CUT-OUT ATTACHMENT.

R. L. Woodward, Jersey City, N. J., patent 916,245, March 23, 1909.

This patent contemplates the interposition of a closed cylindrical chamber between the transmitter proper and the rubber mouthpiece. In this closed cylindrical chamber is a little door which can be operated by means of a lever from the outside of the cylindrical chamber to close the orifice of the mouthpiece, and thus prevent sounds in the room affecting the transmitter.

TELEPHONE RECORDING APPARATUS.

R. D. Lampson, New York, patent 916,458, March 30, 1909, One-half interest assigned J. H. Thompson, New York.

This invention contemplates the recording, at a called subscriber's station, of the number of a calling subscriber, should the called subscriber be absent. To this end, the central station is provided with means for connecting through the two lines to effect this result, and each subscriber's station has a recording device similar to stock ticker recording instruments, and also a segmental sending wheel, which causes the necessary impulses. The segmental sending wheel corresponds to the number of the calling subscriber to transmit dots and dashes indicative of the said number.

TRANSMITTER.

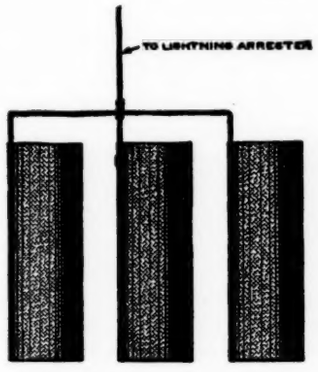
R. Hansen, Sioux City, Ia., patent 916, 950, March 30, 1909, One-half interest assigned to Interstate Supply Co., Sioux City, Ia.

The special features claimed in this patent consist of a slotted bridge, the central slot holding the carbon cup at a point of its largest diameter, and provided with binding posts, which are also fastened in enlarged portions of the slot in the bridge, at the sides of the central slot which carries the carbon cup. The binding posts, which are mounted in the slotted bridge, also support springs which hold the cup both above and below, along its central line. Screws are provided to clamp the sides of the bridge upon opposite sides of the slot, firmly together.

In the Manufacturing Field

The Federal Cartridge Ground Plate.

In the Federal cartridge ground plate, the manufacturer has placed in a compact form, ready to install, all the essentials for a good ground plate. The copper plate type of



A Battery of Federal Cartridge Ground Plates Connected in Multiple.

ground properly made and installed has always given good satisfaction, and the cartridge plate embodies all of its good features. By the use of the cartridge plate it is claimed that a practically perfect ground can be obtained at a minimum of expense and trouble.

This ground plate consists of a flanged copper plate, placed in the center of a strong cylinder-shaped netting, and having the space on either side of the copper plate filled with small sized pieces of charcoal or coke. A No. 4 B. & S. gage copper ground wire is securely attached to the ground plate through its entire length so that there is no chance for a break or loose connection. For convenience in connecting to the device to be grounded, an additional five feet of wire is coiled at the top of the plate. The netting is not intended to last but is simply used for the purpose of holding the plate and charcoal together until installed, when it disintegrates, allowing the earth to come into contact with the charcoal. For handling and shipping the cartridge is placed in a tight fitting pasteboard box.

For protecting the ground wire it has been found advantageous to use a piece of fiber conduit extending from the ground plate to a point well above the surface of the ground. A rope drain placed on the pole or wall immediately above the conduit, will lead considerable rain water into the conduit and thence to the ground plate thus insuring moist earth around the plate.

The cartridges are made in standard sizes suitable for various purposes, and in case the area of one is not sufficient they can be used in multiple as shown in the illustration.

The Federal Electric Company, Lake and Desplaines streets, Chicago, Ill., manufacture this device.

A Big Order Secured by the Dean Company.

The Athens County Home Telephone Company, of Athens, Ohio, has just placed an order with the Dean Electric Company for a complete common battery multiple central office equipment.

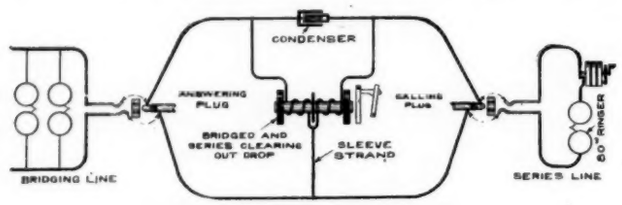
The contract includes equipment for an ultimate capacity of 2,000 lines with an immediate installation of 660 common battery and 50 magneto subscribers' connections. The amount of the order runs well into five figures because it included over 200 telephones and 400 Dean harmonic ringers for changing over the old system to be operated in connection with Dean harmonic party line apparatus.

By purchasing 600 condensers, the customer is able to provide common battery signaling service and still retain the old magneto instruments. A condenser is placed in each telephone circuit so that the subscriber can signal central without turning the crank, but talks through a local battery talking circuit. This plan has long been very successfully followed through consultation with Dean engineers.

The Monarch Clearing-Out Circuit.

The clearing-out circuit shown in the accompanying diagram is the one which the Newton, Ill., Telephone Company has specified for the new 500 line magneto switchboard it has just ordered. This system, it is said, will absolutely prevent the tying up of lines, for either winding of the coil will operate the clearing out drop, and the condenser forces the ringing current through one of these

windings, even if the connection is with a low resistance series telephone, or with a line that has a dead short circuit across it. Although this system is inexpensive, it can readily be seen how it will improve the service of an exchange, for every ring-off signal is sure to reach the board. It is described in detail together with the lamp supervision



Monarch Clearing-out Circuit.

systems in Bulletin No. 5 issued by the Monarch Telephone Manufacturing Company, of Chicago.

The Newton board is also equipped for the Monarch direct current selective system. The managers of the telephone company decided to use this system because of its economy as no ringing device is used and the instruments cost less than regular bridging telephones. It has been demonstrated that this selective system will operate perfectly, even with a short circuit as low as 10 ohms across the line.

The Matthews' Cable Roller.

The value of the Matthews' cable rollers in stringing telephone cable is being realized by telephone managers. Among the telephone companies who are firm believers in the Matthews' products is the Slate Belt Telephone Company, of Flat River, Mo. Mr. E. M. Searce, the general manager of this company, recently put up over 10,000 feet of cable, with the aid of fifty of these rollers. The entire

Running Cable from Reel Over Rollers Suspended from the Messenger.

amount of cable was strung without damage to the cable and with great saving of money and labor. One of the accompanying illustrations shows the cable running off the reel, over the rollers and upon the messenger. The other illustration shows one horse pulling over 1,300 feet of 125 pair cable.

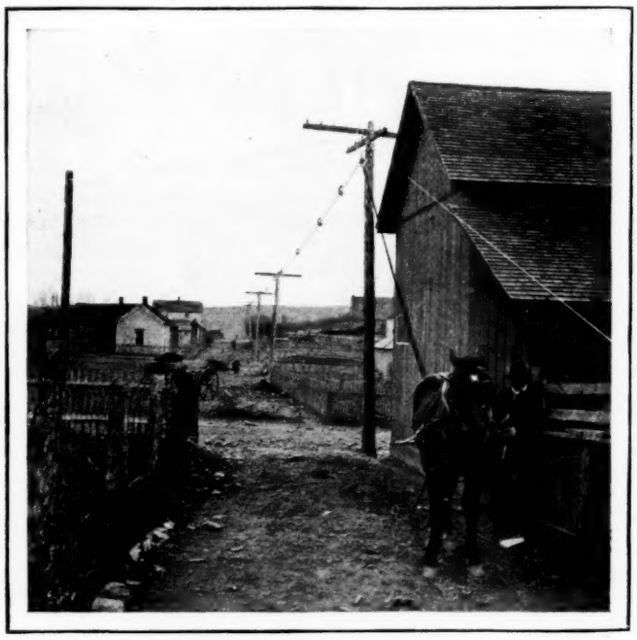
A New Telephone Directory Cover.

Telephone companies who have been annoyed by the constant loss and replacing of telephone directories in their pay stations will welcome a new telephone cover which has recently been placed on the market. These covers are bound in fine durable cloth and can be applied to any paper covered book. They are so constructed as to allow for change in thickness of successive issues. The book is securely held by means of a thin strip of tempered steel which engages with the cover and passes through the middle of the book, having at its upper end a neat clasp or hanger. If desired, a chain can be fastened to this holding strip, securely locking the book in place.

The covers prevent excessive wear and soiling of the directories, and loss through being misplaced or stolen.

The cover, known as the Arnold security telephone cover, has been placed on the market by the Arnold Supply Company, of Milwaukee, Wis., which has secured the exclusive patent and selling rights.

"Quality Telephone Cords" is the title of a carefully and completely illustrated bulletin (No. 47) just issued by the Kellogg Switchboard & Supply Company, Chicago, Ill.



Pulling Cable Along the Messenger.

The illustrations of the cords are very accurate and much above ordinary cuts of this kind, being halftones made direct from the subject. Each grade and class of cords is given with careful description and price, arranged for the convenience of buyers. The bulletin also shows views of the machines on which the cords are made from the first step to the finished cord, which gives an idea of the size and completeness of equipment of the Kellogg factory.

The Columbus Handle & Tool Company, of Columbus, Ind., in its recently issued catalog shows a large line of linemen's construction tools, such as shovels, spoons, cant hooks, pole supporters, etc. This catalog is a valuable addition to the working information of a manager or construction man.

Pamphlet No. 13, recently issued by the Stromberg-Carlson Telephone Manufacturing Company, describes and illustrates magneto telephones for electric interurban and steam railway dispatching systems. The pamphlet will be sent upon request to anyone interested.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. ALFRED ANDERSON has been made manager of the Assaria Telephone Company of Assaria, Kan.

MR. F. H. BOYER, of Page, Neb., has been appointed manager of the exchange of the Nebraska Telephone Company at Elk Creek, Neb.

MR. HARRY POND has been appointed manager of the Branford division of the Hudson River Telephone Company at Branford, N. Y.

MR. J. FULWILER, of Temple, Tex., has been appointed local manager of the Southwestern Telegraph & Telephone Company at Calvert, Tex.

MR. P. J. PECK, formerly in the traffic department of the Southwestern Telephone & Telegraph Company at Dallas, has been appointed local manager at Houston, Tex.

MR. JAMES ROGERS of Earlville, Ia., has accepted the position of superintendent of the Inter-State Telephone Company at Dyersville, Ia., succeeding J. H. Denkhoff, who resigned several months ago.

NEW COMPANIES.

SAN BERNARDINO, CAL.—The principal place of business of the Alhambra Home Telephone & Telegram Company has been changed from Alhambra to Chino by articles of incorporation which were recently filed. The authorized capital stock is $50,000 and the incorporators are: P. F. Spencer, G. G. Miller, L. R. Parks and E. C. Webster, all of Los Angeles, and L. E. Williams of Alhambra.

SEDALIA, COL.—The Sedalia Telephone Company, with a capital of $10,000, has directors as follows: Fred Kingsley, Elmer O. Black and Alfred Stewart.

GAINESVILLE, GA.—With Claude L. Thompson as president and W. L. Awtry, secretary-treasurer, the New Bridge Telephone Company has been organized to construct about 12 miles of telephone line.

BRIGHTON, IND.—Articles of incorporation have been filed with the Secretary of State for a company to be known as the Pretty Prairie Telephone Company. It is capitalized at $14,000, and will build and operate an exchange in Brighton and will build lines in La Grange county. The directors are F. G. Smeltzly, H. C. Plank, M. E. Horner, Anus Long and D. M. Plank.

COMO, IND.—The Como Telephone Company has filed articles of incorporation with the secretary of state and will build an exchange and telephone system in Como extending its lines throughout Jay, Wells and Randolph counties. The capital is $10,000.

INGALLS, IND.—The Fall Creek Telephone Company has been incorporated to build and operate a telephone plant in Ingalls and Green township. Geo. W. Pettigrew, Charles Heday, Geo. W. Sylvester and Chas. O. Norris are the directors.

LAWRENCE, IND.—With a capital stock of $2,500, the Grassy Creek Mutual Telephone Company has incorporated and will operate in Marion and Hancock counties. B. F. Whitesides, Jno. C. Roab and J. B. Mithoefer are directors.

UPLAND, IND.—An Independent Home Telephone Company is being organized at this place.

CLERMONT, IA.—A charter has been issued to the Gunder & Clermont Telephone Company. The officers are: H. S. Groth, president; A. O. Olson, vice-president; G. L. Ostlie, secretary-treasurer. The capital stock is placed at $4,000.

IOWA FALLS, IA.—The Iowa Falls & Owasa Telephone Company has been incorporated with a capital stock of $2,450. The directors are: J. M. Rankin, John Robertson, Joseph Brewster, John Hilmer, George Pemberton, John Melinger and George Melinger.

WYOMING, IA.—With a capital stock of $30,000, the Wyoming Telephone Company has been incorporated by Otto Wettstein, Jr., W. D. Waggoner and J. J. Luneman.

BUXTON, KAN.—The Buxton Telephone Company has been chartered with a capital stock of $1,250 by Andrew Neese, J. E. Chestnut and others.

HALLS SUMMIT, KAN.—The Farmers' Co-operative Telephone Company has been chartered by T. H. Morse, president, and E. H. Carr, both of Lebo, Kan.

OSBORNE, KAN.—A new telephone company has been organized here, out of part of the old Natoma system, to be known as the Osborne Telephone Company. Officers elected are: L. F. Storer, of Portis, president; William Roadhouse, vice-president; W. F. Bell, of Portis, treasurer; F. P. Wells, secretary.

VIDETTE, KAN.—The Auburn & Vidette Telephone Company has been incorporated with a capital of $12,000. The incorporators are J. E. Mans, Station B, Topeka, and P. W. Bundy, Route 24, Auburn, Kan.

HALL, KY.—John Hall and others have organized the Lower Beaver Creek Telephone Company.

MUD LICK, KY.—A new company, to be known as the Mud-Lick Telephone Company, has been organized by W. F. Tacket, Jno. Tacket and others. Capital stock, $2,000.

NEW LIBERTY, KY.—With a capitalization of $2,000 the Ragland Telephone Company of this place has received articles of incorporation. The officers are: M. B. Tapp, president; W. H. Cunningham, vice-president, both of Woodville; T. E. Martin, of Rosington, secretary-treasurer. The directors are: W. H. McKinney, H. J. Baldry, B. M. Anderson, J. T. Covington, J. R. Hill, all of Woodville, and J. M. Harper, of Rossington.

BALDWYN, MASS.—The Baldwyn Home Telephone Company was recently organized, and about $5,000 will be expended in pushing the work forward. The organization was promoted by D. F. Eastman, manager of the Booneville Telephone Company, J. C. McCarthy, manager of the Guntown Telephone Company, and others, and they have already orders for about 300 telephones with which to start. The Independents are very strong in this section, and this company will undoubtedly be successful.

BIG RAPIDS, MICH.—The Hinton Mutual Telephone Company has filed articles of corporation with the county clerk. The company is capitalized at $7,500, and the officers are Geo. Johnson, D. E. Robinson, Wilson Luxon, B. F. Swett and M. Fay.

HARRISVILLE, MICH.—The Citizens' Telephone Company has been incorporated with a capital of $3,000.

HOWARD CITY, MICH.—The Ensley & Oak Grove Farmers' Telephone Company has been organized to build a 13-mile rural line connecting with the Citizens' exchange at Howard City The line will run through Reynolds, Ensley and Croton townships. The officers are: President, F. S. Hillman; secretary, James Kinney; treasurer, James Hanse.

NEW BALTIMORE, MICH.—A new company has been organized to construct a line connecting New Baltimore, Anchorville and Fair Haven, which will be known as the Anchorville Bay Telephone Company. The officers are: President, H. J. Knopf; secretary, A. J. Christy; treasurer, H. M. La Bounty.

SOUTH HAVEN, MICH.—At this place a new telephone company has been organized with the following officers: Geo. F. Reed, president; Wakely Elkenburg, secretary, and W. F. Rainouard, treasurer.

SUNFIELD, MICH.—The Sunfield Co-Operative Telephone Company has been organized with a capital stock of $10,000. Charles M. Ralston, president; W. E. McClelland, secretary, and C. N. Town, treasurer, were the officers elected.

TWINING, MICH.—Under the name of the Twining Mutual Telephone Company a new company has been organized with a capital stock of $5,000. The officers elected are: C. J. Shreeve, president; G. H. Hollister, vice-president; W. H. Townsend, secretary, and John J. Finerty, treasurer.

BRUSHVALE, MINN.—With a capital stock of $10,000, the Brushvale Farmers' Telephone Company has been incorporated by John Holecek, Henry Lordeman, August Zarling, S. Peterson and others of Brushvale.

ODESSA, MINN.—L. R. Gerber, Peter Storm, Lars Bobak and others have organized the Odessa-Correll Farmers' Telephone Company. An effort will be made to connect with the Bellingham Telephone Company.

PINE RIVER, MINN.—Articles of incorporation have been taken out by the Pine River Telephone Company. The capital stock is placed at $10,000 and the secretary is Charles W. Ladu.

WEST CONCORD, MINN.—Incorporation articles have been granted the West Concord Telephone Company with a capital stock of $15,000. The incorporators are: W. T. Schmidt, F. F. Clifford, J. G. McCarthy, E. E. Harrison, H. H. Orcutt.

McLEOD, MONT.—With a capital stock of $2,000 the Maine Boulder Telephone Company has been incorporated with its principal office at this place.

O'NEILL, NEB.—The Michigan Telephone Company has been organized by farmers residing east of this place with the following officers: M. P. Sullivan, president; J. D. Kelley, vice-president; P. C. Kelley, secretary; Jacob Hirsch, treasurer. Directors: D. W. Sullivan, Frank L. Bain, William Hanley. This system will connect Grattan and O'Neill and the line will be about 20 miles in length.

ELY, NEV.—A new company has been incorporated in this place to be known as the Spring Valley Telephone Company. The incorporators are Henry C. Nicholson, Joseph E. Stevens and Eugene Giles.

CORNWALLVILLE, N. Y.—The Mitchell Hollow and Cornwallville Telephone Company, Greene county, has been incorporated, with H. B. Maben, Roscoe Howard, John Barlow, of Windham, Elisha N. Parks, of Cornwallville, as the directors. It is capitalized at $2,000.

ANAMOOSE, N. D.—The Bloomington Valley & Lincoln Telephone Company has been organized, with John Weitz, Jr., as president, and Mr. Essig as secretary. About 60 miles of line will be constructed.

McCLUSKY, N. D.—With a capital stock of $4,000 the Lamont Telephone Company has been incorporated. Emanuel J. Klundt, of Denhoff, N. D.; Jacob Triebwasser, John H. Regier, of McClusky and others are the incorporators.

ATWATER, OHIO.—W. E. Craig and others have incorporated the Atwater Telephone Company with a capital stock of $10,000.

CHARDON CENTER, OHIO.—The Chardon Citizens' Telephone Company was organized at this place. H. S. Knapp, president; C. W. Hudson, secretary, and R. M. Stafford, treasurer, are the officers elected.

WHARTON, OHIO.—A charter has been granted the Wharton Telephone Company. The capital stock is given at $10,000 and the incorporators are: C. M. Wickiser, N. Wickiser, O. E. Reynolds and A. A. Cole of Milton Eby.

BRIDGEPORT, OKLA.—The Waconda & Mound Telephone Company has been incorporated by J. A. Cox, T. C. Walker and C. Karlin, of this place, and W. H. Fossett, of Hinton, with a capital stock of $1,500.

DAMASCUS, ORE.—A. W. Cooke and others have organized the Damascus Mutual Telephone Company, with a capital of $5,000.

HOOD RIVER, ORE.—The Home Telephone Company has been granted a franchise to construct and operate a telephone line in this place.

BEDFORD, PA.—S. F. Whetstone, S. T. Diehl, Samuel Hunt and others made application for a charter for the Friends Cove Telephone Company.

CORYVILLE, PA.—The farmers of this vicinity have organized a telephone company to be known as the Grange Telephone Association. They propose building a line from Coryville to Smethport, taking in Kent Hollow, Moody Hollow and up Potato Creek to Crossmire Crossing.

HORNERSTOWN, PA.—The farmers of South Hanover township have reorganized the Farmers' Mutual Telephone Company, with headquarters at this place. The officers are: William Horst, president; John Alwine, secretary-treasurer. The line will include Hornerstown, Hanoverdale, Union Deposit and Sand Beach, connecting with the American Union Telephone Company at Hummelstown.

NORTH EAST, PA.—The North East Telephone Company has been organized with a capital stock of $20,000 and application will be made for a charter. The officers are: E. A. Orton, president; G. C. Graham, secretary; W. F. McCord, treasurer.

DE SMET, S. D.—A new corporation has been formed with a capital of $3,000 to be known as the De Smet-Mathews Telephone Company. The board of directors consists of R. A. Rounseville, Luke Kelly, August Walstrom and Ole Johnson.

ELLERSON, VA.—Articles of incorporation have been filed by the Hanover Telephone Company with a capital stock of $5,000. The president of the company is E. J. Flippo, and J. B. Bradley is treasurer.

RICHMOND, VA.—The Central Telephone Company of Lovington, Nelson county, was recently incorporated with a capital stock of $5,000. The officers are: President, F. M. Horsley; vice-president, J. C. Clarkson; secretary, E. Carter, all of Lovington.

RICHMOND, VA.—The Rockfish Telephone Company, of Lovingston, has been incorporated by H. T. Harris, president; J. C. Everett, vice-president; Thomas Boyce, secretary-treasurer; S. B. Whitehead, M. K. Estes, all of Lovingston. The company is capitalized at $5,000.

PROSSER, WASH.—The farmers of the Rattlesnake country have organized what is to be known as the Rattlesnake branch of the Benton Independent Telephone Company of this place. The following officers were elected: President, Arthur Rothrock; vice-president, J. N. Crosby; secretary, S. C. Crooks. The company expects to build about 25 miles of line this spring.

SEATTLE, WASH.—The Seattle Home Telephone Company has been incorporated with a capital stock of $500,000 by Samuel Hill, Hervey Lindley, E. A. Stuart, M. H. Arnold and W. G. Collins.

CURRAN, WIS.—The Curran Farmers Telephone Company was incorporated with a capital stock of $2,500 by D. A. Stoits, W. M. Merrill, W. F. Curran and others.

KAUKAUNA, WIS.—Recently the South Greenville Farmers' Telephone Company was organized with the following officers to operate in the town of Greenville: President, Louis Pringle; secretary, J. H. Schneider; treasurer, A. G. Mass.

MADISON, WIS.—The Ellington Farmers' Telephone Company of Outagamie county has been incorporated here by John Wittlin, Wm. L. Lord, P. Wallace, Louis E. Nichols and Fred Ort with a capitalization of $2,000.

BIENFAIT, SASK., CAN.—With about fifty subscribers a committee of the business men and grain growers have organized a rural telephone system which will connect Bienfait with Shand, Albany, Taylorton and Roseview settlements. Ira B. Brown is interested in the project.

FORT WILLIAM, ONT., CAN.—The farmers of Paipoonge township are organizing to secure a rural telephone system with connections to Port Arthur and Fort William. Dr. D. C. Garver is interested in the project.

SUMMERLAND, B. C., CAN.—The Lake Shore Telephone Company, with headquarters in this place, was organized recently with a capital stock of $25,000.

FINANCIAL.

LITTLE ROCK, ARK.—The capital stock of the Rector Co-Operative Telephone Company has been increased from $5,000 to $15,000.

LEBANON, IND.—The Elizabeth Co-Operative Telephone Company has increased its capital stock for the purpose of extending and improving its plant. M. E. Shirley, secretary.

CAWKER CITY, KAN.—The Cawker City Mutual Telephone Company has declared a semi-annual dividend of 6 per cent.

HIAWATHA, KAN.—The North East Kansas Telephone Company, of which F. M. Pearl is president, has increased its capital stock to $20,000.

ST. PAUL, MINN.—The Stevens County Telephone Company has increased its capital stock from $15,000 to $40,000.

RICHWOOD, MO.—The Richwood Telephone Company has increased its capital stock from $50,000 to $65,000.

NORTON, N. DAK.—The Norton Telephone Company, formerly the Norton Farmers' Telephone Company, has increased its capital stock from $10,000 to $30,000.

BELLEFONTAINE, OHIO.—A dividend of four per cent has been declared upon all stock certificates of the Logan County Farmers' Telephone Company issued prior to October 1, 1908. The capital stock has also been increased from $5,000 to $15,000.

CONESTOGA, PA.—The Conestoga Telephone Company is considering increasing its capital stock from $15,000 to $40,000.

CUMBERLAND, WIS.—The McKinley Telephone Company, formerly of McKinley, has changed its headquarters to Cumberland, and has increased its capital from $500 to $10,000.

SUSSEX, WIS.—The Lisbon Telephone Company has increased its capital stock from $720 to $5,000.

FRANCHISES.

EUREKA SPRINGS, ARK.—A 20-year franchise has been granted the Greenwood and Winona Party Telephone Company by the city council.

STOCKLEY, DEL.—The Stockley Telephone Company has been granted a franchise to build a line from Stockley to Bryan's.

HOWESVILLE, IND.—A franchise has been applied for by the Farmers' Telephone Company to install a system in Jasonville.

OVERLOOK, KAN.—The Burnett Telephone Company has been granted a right of way along the roads in Valley Brook township for the erection of telephone lines.

GRACEVILLE, MINN.—A franchise to operate an exchange has been granted to the Home Mutual Telephone Company at Graceville.

WEST CONCORD, MINN.—The Farmers' Telephone Company will apply to the city council for the right to construct lines in all parts of the village. A central office will also be installed.

BROWN'S MILLS, N. J.—The Farmers' Telephone Company of this place has been granted the right of way to enter the southern section of Hamilton township.

WILLIAMSVILLE, N. Y.—A franchise has been granted by the town board, giving the Federal Telephone and Telegraph Company power to run wires upon the poles of the Williamsville Electric Light and Power Company, in order to furnish service to a certain part of the town.

KENSAL, N. D.—L. C. Lane has been granted permission by the city council to operate telephone lines in this place.

TOLLEY, N. D.—The village council has granted Mr. W. A. Minar a franchise to erect a telephone.

XENIA, O.—The Port William Mutual Telephone Company, which has a franchise in Clinton county, is asking for a franchise in Green county, so that service may be given people living in this vicinity.

PORTLAND, ORE.—The Home Telephone Company has been granted a franchise to construct and operate telephone lines between Linnton, Holbrook, and from this line along the Cornelius Gap road, Newbury road and Germantown road to the Washington county line.

FORT WORTH, TEX.—A franchise has been granted E. R. Brown and others by the Tarrant County Commissioners' Court to erect a telephone and telegraph line.

CENTRALIA, WASH.—A franchise has been secured in South Bend by W. W. Cannon, C. S. Gilchrist and F. B. Hubbard of Centralia, J. L. Meyers of South Bend and H. W. McPhail of Raymond for the construction and operation of telephone lines in the two latter places.

CONSTRUCTION.

BATTLE CREEK, MICH.—At the annual meeting of the Battle Creek Telephone Company, it was voted to erect an addition to the central office, to be used as a business office.

ELY, NEV.—The Spring Valley Telephone Company, which was recently organized by Henry C. Nicholson, Joseph E. Stevens and Eugene Giles, proposes to build a line from Muncey to Osceola.

GROTON, S. D.—A new line will be built from this place to Bristol, by the Groton-Ferney Telephone Company.

LOCKPORT, N. Y.—The Niagara County Telephone Company has been awarded the contract to install and maintain a police patrol telephone system. The system will consist of 22 boxes directly connected with the police headquarters. The contract covers a period of five years.

ELECTIONS.

WOODLAND, CAL.—The Woodland Colony Telephone Company, at its recent meeting, elected the following directors: John Zweep, C. D. Wolfer, Oscar Froling; secretary, J. B. Corson, and treasurer, Frank Dixson.

BEAUCOUP, ILL.—At its annual meeting the Beaucoup Mutual Telephone Company re-elected S. W. Jack, president; G. W. Edwards, vice-president; O. Brannum, secretary, and J. W. Caruth, treasurer.

BRIGHTON, ILL.—The board of directors of the Brighton Mutual Telephone Company has elected the following officers: S. G. Brown, president; Miss Nell Flanagan, secretary; E. G. Byford, treasurer; W. G. Hunt, general manager. The control and management of the company is vested in the board of directors who are: C. C. Schmidt, Martin Fuser, Anthony Bott, James Price, George Jones, Frank Elliott, Thomas Ingham, Herman Scheffel, Frank Roberts, T. Eddington, Richard Taylor, Henry Stamm, E. G. Byford and others.

ELGIN, ILL.—At a recent meeting of the stockholders of the McHenry County Telephone Company the following officers were elected: Peter Klein, president; Dr. C. C. Miller, vice-president; N. V. Woleben, secretary-treasurer; directors, Peter Klein, Dr. C. C. Miller, N. V. Woleben, Dr. J. F. Yarmond and J. W. Osborne.

FLANAGAN, ILL.—The Flanagan Mutual Telephone Company has elected the following officers: President, P. M. Schertz; vice-president, Eli Stuckey; secretary, A. L. Thompson; treasurer, J. J. Flessner. All the old directors were re-elected excepting B. M. Slagle, who resigned and has been succeeded by P. M. Schertz.

GRAYMONT, ILL.—For the ensuing year the following officers were elected by the Graymont Central Telephone Association at its recent annual meeting: Thomas Cavanagh, president; A. A. Burcky, secretary; William Tuttle, treasurer.

GREENVIEW, ILL.—Officers for the Sweetwater Telephone Company were elected as follows at the recent annual meeting: President, Robert Grimsley; vice-president, John Terhune; treasurer, Samuel Ennis; secretary, John Brasfield. Directors, A. H. Cleavland, Lemuel Goff, Fred Goff and Edward Mundy.

PONTIAC, ILL.—The Waldo Telephone Company elected the following officers at its recent meeting: President, C. Ringerberger; secretary-treasurer, Louis Stalter. The directors are: J. Stalter, Louis Van Doren, Rinard Pinuke, John Huxtable, Pete Ulrich.

ST. ANNE, ILL.—The following officers were elected by the West St. Anne Telephone Company at its annual meeting: President, Arthur G. Sirois; secretary, Eugene Duby; treasurer, Geo. E. Boone.

BLOOMINGDALE, IND.—As the board of directors, at the annual meeting of the Home Telephone Company, the stockholders recently re-elected William Hadley, president; H. C. Swain, vic-president; A. E. Morrison, secretary; E. B. Morrison, treasurer; Dr. J. G. L. Myers.

MICHIGANTOWN, IND.—The stockholders of the Michigantown Co-Operative Telephone Company have elected the following directors: Edward Lee, Samuel Brandon, William Derrick, Dr. Nolan Thorpe, Levi Tolle, William Huffer, Jos. Smith, W. S. Waits, Osman Price. The officers elected by the directors are: President, William Huffer; secretary, Charles Deihl; treasurer, C. W. Everman.

NEW ALBANY, IND.—The Harrison County Telephone Company recently elected the following officers: President, Philip Blunk; vice-president, Conrad Richert; secretary, Erastus Smith; treasurer, Charles Treese; superintendent, Thomas Evans. Directors, R. R. Tart, F. Voelker and Louis Zabel.

PETERSBURG, IND.—The following officers have been elected by the Stendale Home Telephone Company: Abner T. McAllister, president; J. S. Barrett, vice-president and secretary. Board of directors: Fred Schmacher, William Stahl, Jacob Brewster, Ora Ferguson, and Louis Bartlet; Superintendent, Ernest Egbert.

BANGOR, IOWA.—The Bangor Telephone Company held its annual meeting recently and elected the following officers: H. M. Green, president; C. C. Carson, secretary; C. R. Whinery, treasurer, and D. C. Norman, W. P. Whinery, S. Jessup, D. L. Stanfield forming the directorate.

CONROY, IOWA.—The Iowa-Hilton Telephone Company recently held its annual meeting electing the following officers for the ensuing year: H. W. Maas, president; W. A. Welch, vice-president; John Ahrens, secretary, and G. Furler, treasurer.

GERMANTOWN, IA.—At the recent annual meeting of the Caledonia Telephone Company all the old officers were re-elected. They are: Edward Dobbertin, president; Edward Beermann, vice-president; Hartwig Meyer, treasurer; R. B. Knuth, secretary. Directors, Charles Meyer, William Hoermann and Fred Fiddelke.

LE CLAIRE, IA.—At the annual meeting of the LaClaire Independent Telephone Company, James L. Brown was elected president; James A. Laird, vice-president and A. A. Dawley, secretary.

MONETTE, IA.—The officers of the Mutual Telephone Company, elected at a recent meeting, are as follows: L. P. Zolman, president; S. L. Shigley, vice-president; D. Swindler, secretary.

PORTLAND, IOWA.—The annual meeting of the Portland Center Telephone Cmpany recently re-elected its officers, who are: President, George Steiner; vice-president, B. S. Potter; secretary, Arthur Bauer.

SABULA, IA.—The stockholders of the Sabula Telephone Company recently elected the following officers: President, W. Struve, vice-president; H. J. Giddings; director, A. W. Giddings; manager, A. C. Babcock.

COLUMBUS, KAN.—At the recent annual meeting of the Cherokee County Mutual Telephone Company Wm. Schaffer was elected president, M. A. Householder secretary, and Emerson Hull treasurer.

ENGLEWOOD, KAN.—The stockholders of the Beaver & Cimarron Valley Telephone Company recently elected the following officers: President, N. L. Cornwell; vice-president, W. L. Detwiler; secretary, J. Y. Alexander; treasurer, H. A. Hull; directors, H. A. Hull, J. C. Crasham, J. W. Humphrey and Fred Wells.

MONTANA, KAN.—At the recent meeting of the Labette County Mutual Telephone Company H. W. Clark was elected president; F. Wheatley, secretary, and J. M. Holt, treasurer.

OSSAWATOMIE, KAN.—The stockholders of the farmers' Mutual Telephone Company at their recent annual meeting elected the following directors for the year: E. B. Dorman, John Chitwood, Owen Hunsberger; Harry Milis, Frank Vohs, S. M. Pearson, C. H. Barr, C. J. Matthews, J. L. Coker, D. L. Barrett.

PLEASANTON, KAN.—At the annual meeting of the Oak Grove Telephone Company held at Oak Grove, W. V. Pine was elected president; Ross E. Crawshaw, vice-president; O. Idle, treasurer, and Charles Knox, treasurer.

EMINENCE, KY.—The stockholders of the Home Telephone Company have elected the following directors for the ensuing year: W. S. Wilson, Prentice Clubb, W. J. Thomas, I. B. Helburn, J. W. Obannon, P. C. Smith, W. T. Chilton, Jno. A. Crabb, W E. Clubb. The officers are: President, W. S. Wilson; vice-president, Prentice Clubb; secretary-treasurer; J. C. Helburn; manager, R. L. Rutherford.

CALEDONIA, MICH.—At the stockholders' annual meeting of the Leighton Farmers' Telephone Company, held recently at Leighton Center the following officers were elected: Robert Smith, president; Lewis Kaechele, vic-presidnt; John Steeby, secertary; Leonard Hooker, treasurer. The trustees are: Jesse Pickett, R. J. Steeby and David Thaler.

EDGERTON, MINN.—At the annual meeting of the Enterprise Telephone Company the following were elected directors: P. O. Goembel, of Luverne, president; K. G. Odre and R. B. Hinkley, of Luverne; John F. O'Connor, of Lismore; John Debore, of Leota, and William Lockwood, of Pipestone.

MANKATO, MINN.—The Rapidan & Mankato Telephone Company held its annual meeting recently at which the following officers were re-elected: F. O. True, president; George Ballard, vice-president; A. L. Viegel, secretary, and Daniel Bosin, treasurer; John Holberg, Eric Holberg and Joseph Kern, directors.

SPRINGFIELD, MINN.—The Farmers' & Citizens' Mutual Telephone Company recently re-elected its old officers, who are as follows: Dr. J. S. Shrader, president; A. G. Anderson, vice-president; C. A. Hintz, secretary, and W. G. Frank, treasurer.

STARBUCK, MINN.—The annual stockholders' meeting of the White Bear Lake Telephone Company resulted in the election of the following directors: B. M. Tessem, P. W. Sylvester, Carl J. Lingen, Claus Bankol, A. E. Anderson, I. M. Kalnes, G. H. Kjorstad, Ole S. Ronnei and P. P. Klevan. The officers are: President, B. M. Tessem; vice-president, P. W. Sylvester; secretary, I. M. Kalnes; treasurer, Carl J. Lingen.

GASCONADE, MO.—At its annual meeting, the Gasconade Central Telephone Company elected the fololwing board of directors for the ensuing year: Judge D. F. Stoenner, E. T. Williams, H. E. Phillips, J. H. Hasenritter, and Judge Frank Oncken. The officers of the company are: Judge Stoenner, president; Judge Oncken, vice-president; E. T. Williams, general manager and H. E. Phillips secretary-treasurer.

HARTINGTON, NEB.—At the annual stockholders' meeting of the Cedar County Farmers' Telephone Company, the following directors were re-elected: I. O. Bingham, Martin Bottolfson, C. H. Whitney, B. Ready, F. O. Robinson.

LEBANON, N. J.—The Lebanon Telephone Company has elected officers as follows: President and treasurer, S. J. Shurts; vice-president, George Clark; secretary, O. A. Farley; general manager, Erastus W. Sutton. Board of directors is composed of Dr. H. H. Miller, George Clark, J. C. Farley, J. E. Ramsey, S. J. Shurts, E. W. Stuton and O. A. Farley.

ITHACA, N. Y.—The Danby Telephone Company at its annual meeting recently elected the following officers: President, J. E. Black; vice-president, Fred B. Van Etten; secretary, Dr. Carl Denman.

WILLOW POINT, N. Y.—At the recent annual meeting of the Willow Point Telephone Company the following officers were

elected: C. M. Golden, president; Isaac Mosher, vice-president; Lee Winaus, secretary; Frank Gates, treasurer. The directors include the officers, together with S. L. Noosbickle, Bernard O'Hara, Samuel Burrows.

ROCHESTER, N. Y.—The recently elected board of directors of the Rochester Telephone Company has re-elected George R. Fuller, president, with George F. Roth, vice-president; W. Roy McCanne, treasurer, and Joseph W. Taylor, secretary.

MANDAN, N. D.—The Mandan Telephone Company re-elected its directors and officers at the annual meeting of stockholders. Officers: President, C. E. V. Draper; vice-president, T. A. Cummins; secretary, G. B. Furness; treasurer, Jos. P. Hess. Directors: C. E. V. Draper, T. A. Cummins, B. W. Stephenson.

ADAMSVILLE, OHIO.—The Adamsville Independent Telephone Company chose the following directors at its annual meeting held recently: E. C. Jordan, G. A. Geyer, F. O. Hardy, F. M. Slater, C. B. Bell, G. W. Williams, F. W. Elsea.

BELLEFONTAINE, OHIO.—The Logan County Farmers' Telephone Company, at its annual meeting, elected the following directors: J. C. Rock, Dr. A. C. Brindle, J. W. Startzman, Dr. Charles Garver, all of West Liberty; Denton Crowe, Charles Dachembach, of Springhills; W. J. Dachembach, S. E. Detrick, J. S. Nicholls, North Exchange; J. W. Hoffman and J. Calland, Rosewood. The directors chose the following officers: President, Denton Crowe; vice-president, Charles Garver; secretary, W. J. Dachembach; treasurer, J. S. R. Nicholls; general manager, Charles F. De Remer.

NEW KNOXVILLE, OHIO.—At its annual meeting the New Knoxville Telephone Company elected the following directors: E. H. Meckstroth, A. H. Stienecker, L. H. Meckstroth, G. W. Holl, Adam Holl, William Haberkamp, L. W. Kattman.

BUFFALO, PA.—The Buffalo Mutual Telephone Company at its annual meeting elected the following officers for the coming year: H. L. Snodgrass, president; S. P. Wilson, vice-president; Alexander Hamilton, secretary, and James Allison, treasurer.

CANONSBURG, PA.—Last year's very efficient corps of officers of the Farmers' Mutual Telephone Company were re-elected at the recent stockholders' annual meeting. They are: R. L. Munce, president; R. B. Blaney, vice-president; B. K. McConnell, secretary; John Fulton, treasurer.

CLARKSVILLE, PA.—The Clarksville Telephone Company, reorganized at a recent meeting, elected the following officers: L. T. Holder, president; W. A. Parnell, secretary; John W. Dalby, treasurer; C. A. Bennett and I. H. Young, auditors.

CAMP CROOK, S. D.—The following officers have been elected for the Ekalaka Telephone Company: George Boggs, president, and W. A. Morgan, vice-president.

BRENHAM, TEXAS.—For the ensuing year the following officers were elected by the Brenham & William Penn Telephone Company: W. D. Farmer, president; B. Kessel, secretary-treasurer; board of directors, F. Feusse, H. Holle, H. Muegge, William Schwartz and W. D. Farmer.

FREDERICKSBURG, VA.—The following officers were elected at the annual meting of the stockholders of the Spotsylvania Telephone Company: George W. Perry, president; N. L. Mills, vice-president; M. F. Waite, business manager; W. B. Warren, secretary-treasurer. The board of directors is composed of: C. R. Coleman, M. F. Waite, N. L. Mills, W. G. Dilard, T. A. Haris, R. L. Briscoe, Lee J. Graves.

CHELAN, WASH.—The East Side Telephone Company at its recent annual meeting elected these officers: H. A. Steele, president; Thomas Lommasson, vice-president; Charles Clover, secretary-treasurer. Directors: L. H. Millard, W. C. Hogenson, E. A. Stone.

AMHERST, WIS.—The Amherst Telephone Company at its annual meeting elected the following officers: President, G. B. Allen; vice-president, C. A. Smith; secretary, L. J. Carey; treasurer, J. O. Foxen. Directors: B. F. Lewis, T. Howen, H. H. Hoffman, Martin Heffron and Markus Hansen.

APPLETON, WIS.—At the first meeting of the recently organized Apple Creek Farmers' Telephone Company the following officers were elected: F. A. Ziegler, president; C. W. Schroeder, vice-president; Albert Luebke, treasurer; F. A. Viergutz, secretary. The board of directors elected is: F. A. Ziegler, W. F. Wieckert, Robert Schiebe, C. W. Schroeder, Henry Weise, Albert Luebke, F. A. Viergutz, William Shusler and John Schwemer.

KAUKAUNA, WIS.—As president of the South Greenville Farmers' Telephone Company, Louis Pringle was elected, with J. H. Schneider, secretary, and A. G. Mass, treasurer.

MINONG, WIS.—The stockholders of the Lake Shore Telephone Company have re-elected the old officers, who are as follows: E. F. Swanson, president; J. J. Hohl, vice-president; Frank Spafford, secretary; W. H. Zwickey, treasurer. Directors: J. V. Gilbert, O. E. Goodlacson and E. F. Swanson.

OCONOMOWOC, WIS.—At the annual meeting recently held by the Badger Telephone Company the following officers were elected for the coming year: Thomas Steele, president; J. J. Reid, first vice-president; C. H. Counsell, second vice-president; H. E. Rosenow, secretary-treasurer.

RANDOM LAKE, WIS.—At the stockholders' meeting of the Random Lake Telephone Company the following officers were elected. Peter Feider, president; N. Weber, vice-president; H. P. Sinnen, secretary; Frank Arendt treasurer; W. B. Krause, superintendent. Directors: Peter Feider, H. P. Sinnen, W. B. Krause, N. O. Muelle, N. Medinger and M. Kieffer.

TOMAH, WIS.—The Tomah Electric & Telephone Company held the annual meeting of its stockholders recently at which time the old board of directors was re-elected. They are: Hervey A. Lightner, John H. Coulter and Wm. McCaul, and have organized with Hervey A. Lightner, president; John H. Coulter, vice-president and treasurer; William R. McCaul, secretary.

JACKSON, WYO.—The following officers were elected at the recent annual meeting of the Jackson Valley Telephone Company: President, J. C. Fisk; vice-president, S. N. Leek; secretary, W. W. Smith; treasurer, Miss May Lovejoy; general manager, Fred Lovejoy.

UNION, MAN., CAN.—The Union Farmers' Telephone Company of this place, at its annual meeting, elected the following as its officers: President, W. G. Pollock; vice-president, Robert Hunter; secretary-treasurer, Walter Brydon.

MISCELLANEOUS.

WASHINGTON, D. C.—An American consul in Africa has been asked to secure from American manufacturers an approximate estimate of cost of the equipment, exclusive of poles and wire, of a telephone system of 500 instruments. Further information can be obtained from the Bureau of Manufactures at Washington.

ROSSVILLE, ILL.—The work of repairing the damage done to the Rossville Telephone Company's plant by the recent fire is progressing very rapidly. The lines are practically all replaced and business has been resumed on both toll and city lines.

MAJENICA, IND.—The Majenica Telephone Company, which operates an exchange in Markle has purchased the Julus Yoos property in that place, and will establish a local exchange in it.

PERU, IND.—The new directory of the Home Telephone Company is rapidly nearing completion and will list over 2,000 subscribers.

BENDENA, KAN.—The stockholders of the Bendena Mutual Telephone Company have decided to incorporate. The directors of the company are: W. H. Myers, Edwin Jones, R. J. Johnson, Walter Zimmerman and A. F. Albers.

CAWKER CITY, KAN.—The Cawker City Mutual Telephone Company has purchased the exchange of the old Cawker City Telephone Company, and will make improvements and extensions to the system.

COLUMBUS, OHIO.—The offices of the Columbus Citizens Telephone Company have been thoroughly remodeled, and the local offices and counting room have been radically changed so as to give more room for the growing force, and to provide space for the auditor, which office was recently created.

NEW HOLLAND, PA.—Over 700 telephones are now in operation by the Enterprise Telephone & Telegraph Company at this place.

CROCKER, S. D.—Hans Rasmussen and others are interested in agitating the organization of a farmers' telephone company.

CLARKSVILLE, TENN.—On April 3 the property and franchise of the Home Telephone Company was sold, under foreclosure, by special master E. B. Denison. It was bid in by Dancy Fort, trustee for the bondholders, for $44,650. The company controls Independent lines in Montgomery, Houston and Stewart counties and has a well built exchange at Clarksville. The business will be continued and extended. Mr. Denison will probably continue as manager of the property.

ANAHUAC, TEX.—The wiring and outfit of the Lone Star Canal Company telephone system has been purchased by Anson Miller, now owner of the Anahuac & Stowell Telephone line. An exchange building will be erected and the line extended to Wallisville.

BURLINGTON, WIS.—Farmers in the towns of Spring Prairie, Bloomfield and Geneva are interested in organizing a telephone company in the town of Lyons, Walworth county.

MENOMONIE, WIS.—Farmers in the southeastern part of Dunn and Eau Claire counties, and the northern part of Pepin county are discussing the organizing of a farmers' mutual telephone company, the main exchange being located in Rock Falls.

VIOLA, WIS.—The business men of Viola are organizing a local telephone company having assurances from 200 farmers in the vicinity that they will be subscribers for the service.

ST. JOHN, N. B., CAN.—It has been decided unanimously to petition the New Brunswick Legislature, by the New Brunswick Union of Municipalities, to take over the New Brunswick telephone system.

UNDERGROUND.

SAN BERNARDINO, CAL.—Permission has been granted the Home Telephone Company to place conduits under certain county property in order that the company may place all its wires in the fire district underground.

ATLANTA, GA.—A committee of the council on electric lights considered a resolution to rigidly enforce the law compelling corporations to put underground all electric wires, excepting trolley wires.

PARSONS, KAN.—The Citizens Home Telephone Company is asking the council for permission to place its wires underground, and it is possible the council will require it to put all its wires within the fire limits of the town underground.

MARYVILLE, MO.—Permission was granted to the Hanamo Telephone Company to put its wires underground. The main cables will be put into the conduit which will be laid between Main and Buchanan streets.